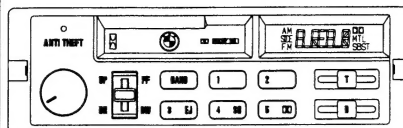


Service Manual



**ORDER NO.
CRT 1150**

US- Gerät
BMW ANTI-THEFT RADIO

KE-81ZBM-02 US

Note :

- See the separate manual CX-156 (CRT-468) for the cassette mechanism description.
 - Dolby and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.
 - Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.
- BMW No. 88 88 1 600 155

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SPECIFICATIONS

TUNER

FM Receiver

Usable Sensitivity (Load)	1 μ V
[30 dB (N + D)/(S + N + D)]	
Signal/Noise Ratio (1 mV)	65 dB
Overload Signal	1 V
AM Rejection	40 dB
IF Rejection	100 dB
Image Rejection	50 dB
Spurious Rejection	70 dB
Alternate Channel Selectivity	60 dB
Capture Ratio	2 dB
Stereo Separation (1 kHz)	40 dB
Stereo Distortion (1 mV)	0.5%
Frequency Range	87.9 to 107.9 MHz
Intermediate Frequency	10.7 MHz

AM Receiver

Usable Sensitivity	10 μ V
[20 dB N/(S + N)]	
Signal/Noise Ratio (5 mV)	50 dB
Selectivity (\pm 10 kHz)	100 dB
IF Rejection	100 dB
Image Rejection	60 dB
Distortion (5 mV RF)	0.5%
Frequency Range	530 to 1620 kHz
Intermediate Frequency	450 kHz

WB Receiver

Usable Sensitivity (Load)	0.3 μ V
[20 dB (S + N)/(S + N + D)]	

Signal/Noise Ratio (1 mV)	55 dB
Distortion	1.5%
Frequency Range	162.400 to 162.550 MHz (25 kHz Step)

Intermediate Frequency	
1st I.F.	10.7 MHz
2nd I.F.	450 kHz

Cassette Deck

Wow and Flutter WRMS — JIS	0.07%
Signal/Noise Ratio	50 dB
Dolby NR Effect	10 dB
Separation	50 dB
Cross Talk	55 dB
Distortion	1%
Frequency Response (—3 dB)	
Normal	40 Hz to 15 kHz
Metal	40 Hz to 18 kHz

Audio Control

Tone Control Response	
Treble Boost/Cut	10 kHz \pm 10 dB
Bass Boost/Cut	100 Hz \pm 10 dB

Power Amplifier

Power Output ($R_L = 4 \Omega$, $V_{CC} = 14.4$ V)	
10% THD	16 W/Ch
1% THD	13 W/Ch
THD ($R_L = 4 \Omega$, $V_{CC} = 14.4$ V)	
$P_o = 1$ W	0.07%
Frequency Response	
(\pm 3 dB)	20 Hz to 40 kHz
Signal/Noise Ratio	65 dB

NOTE: Specifications are subject to change without notice.

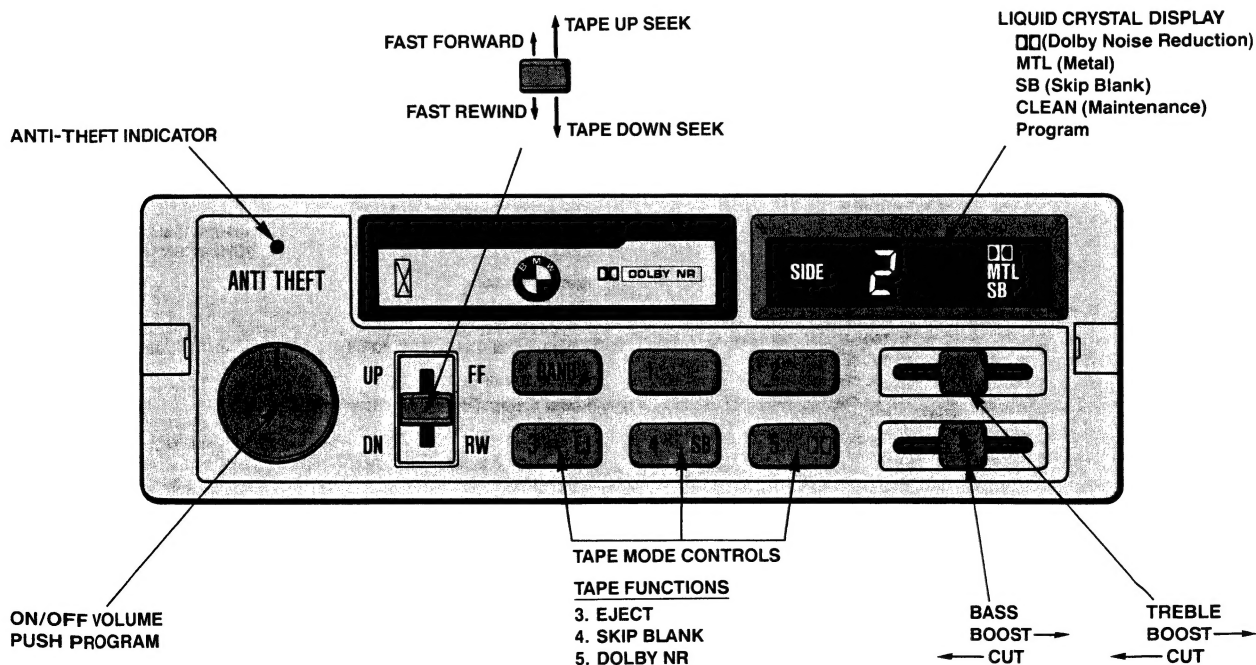
PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 2740 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

1. ANTI-THEFT

The BMW anti-theft radio circuitry is designed to essentially render your radio unsaleable if it is stolen. If the radio is subsequently electrically reconnected, it will not operate until a five-digit security code assigned to your radio is entered. The anti-theft features and operation are as follows:

1. After the ignition key is removed, the red "anti-theft" LED will continuously flash, drawing attention to this feature.
2. Should anyone, such as a thief, touch any pushbutton on the radio after the key is removed, the anti-theft inscription will flash and a warning tone will sound for 5 minutes or until the ignition is turned on.
3. If the voltage supplied to the radio drops below a preset value due to a weakened battery, repair work, or removal of the radio (by a thief), the radio will be inoperative once voltage is restored. This condition will be indicated by the word "code" being shown on the display.
4. The proper 5 digit code shown on the TWO CARDS SUPPLIED TO YOU must then be entered (using the proper **number** radio pushbutton selectors) when the radio is on and the display shows "code". If the correct code is not entered in three successive tries, the radio will not accept entry until the radio has been left **on** for one hour with the ignition on.
IMPORTANT: When entering the 5 digit code number, be sure to complete sequence numbering of that 5 digit code. For example: Code No. sequence is 43215 and you mistakenly enter **42** instead of **43**, continue the code number sequence of 215 to complete that entry. In this case, a "beep" will sound to signal input of the 5-digit code, the word "code" will remain on the display, and the radio will not operate. Re-enter the correct number sequence of 43215 and operation of the radio will continue. The likelihood of guessing the correct code is extremely remote. The radio is, therefore, unsaleable to a thief.
NOTE: If an audible beep is heard while entering the 5-digit code, STOP immediately! Begin entering the code again, starting with the first number of the 5-digit code.
5. The code card should be placed in your wallet, or with the vehicle title papers for security as deemed necessary by your individual needs. Do not leave your code cards in vehicle.
6. Should radio or electrical repairs become necessary, please give the repairing facility the radio code number. If you do not, only authorized BMW dealer personnel can obtain the code from BMW.
7. Should you lose your code cards, contact the nearest BMW dealer who will then obtain your code from BMW. You may be charged for removal of the radio to ascertain the radio chassis number.
8. **WARNING:** FOR YOUR PROTECTION, CODES WILL **NOT** BE GIVEN OUT TO ANYONE UNDER ANY CIRCUMSTANCES OTHER THAN AUTHORIZED BMW DEALER PERSONNEL AFTER PROOF OF VEHICLE OWNERSHIP AND PROPER IDENTIFICATION IS ESTABLISHED.

2. USING THE TAPE DECK



1. CASSETTE OPERATION

To use the cassette, the radio must be in "ON" position. Inserting a tape cassette automatically switches the unit and dual function controls from the radio to the tape mode.

2. LOGIC CONTROL

This radio utilizes logic circuitry that automatically determines the correct direction for fast forward and rewind. A standard cassette has two sides that are played in either direction. When a cassette is playing, the top side will be indicated on the display as program "SIDE 1"; the bottom side will be program "SIDE 2".

3. FAST FORWARD/REWIND TAPE SEEK

The fast forward/rewind lever employs 2-step operation. Raising the lever one step is used for fast forward, while lowering the lever one step is used for fast rewind. Fast forward/rewind can be cancelled by raising or lowering the lever again one step. Raising or lowering the fast forward/rewind lever two steps (as far as it will go) activates the tape seek operation. "SEEK" will appear on the Liquid Crystal Display. Raising the lever automatically moves the tape to the next selection on the tape for playback. Lowering the lever returns the tape to the beginning of the current selection for playback.


Tape "SEEK" will only function if four seconds of silence exist between selections. However, excessive record player stylus noise, due to dust or scratches on the record on home-recorded tapes may interfere with these functions.

The cassette automatically ejects from the unit if tape setting operations cannot be completed within a few seconds. This may be caused by a faulty or damaged cassette. Determine the cause of the problem or use a different cassette.

4. PROGRAM

Press the volume knob to reverse the current direction of tape transport. The tape will automatically reverse when the end of either side is reached.

5. DOLBY NOISE REDUCTION

Dolby Noise Reduction reduces the level of "tape hiss" inherent in cassettes by "encoding" the tape. Use of the Dolby NR function with non-Dolby NR tapes will decrease high frequency response. By not using the Dolby NR function with Dolby NR encoded tapes, the high frequency response will be intensified. The symbol "" will appear on the display when the Dolby NR button is pressed.

6. TAPE EJECT

Press the eject (EJ) button to eject tape cassette and return to the radio mode.

7. AUTOMATIC EQUALIZATION

The playback equalization of NORMAL tapes differs from CHROME (CrO₂), and METAL tapes. When a high biased tape (including metal) is inserted, the unit will automatically change to the correct equalization level and "MTL" will be indicated on the liquid crystal display.

8. SKIP BLANK (SB)

The skip blank function causes the unit to automatically advance the tape to the next recorded portion when a blank section of tape exceeds approximately 12 seconds. When a long unrecorded portion is detected at the end of a tape, the unit advances the tape to the end and then switches to the other side of the tape. The indicator "SB" appears on the display when the skip blank (SB) button is pressed. Additionally "SEEK" will be displayed while the tape is automatically advanced during skip blank operation.

9. IGNITION "KEY OFF" PAUSE

When the ignition is turned off while a tape is playing, the cartridge will automatically enter the pause mode (pinch roller release). When the ignition is turned on the unit will return to the normal play mode. When the unit is in the pause mode it will not accept another cassette.

10. AUTOMATIC TAPE SLACK CANCELLER (ATSC)

The automatic tape slack canceller removes any slack in the cassette tape before play to protect and extend the life of your tapes.

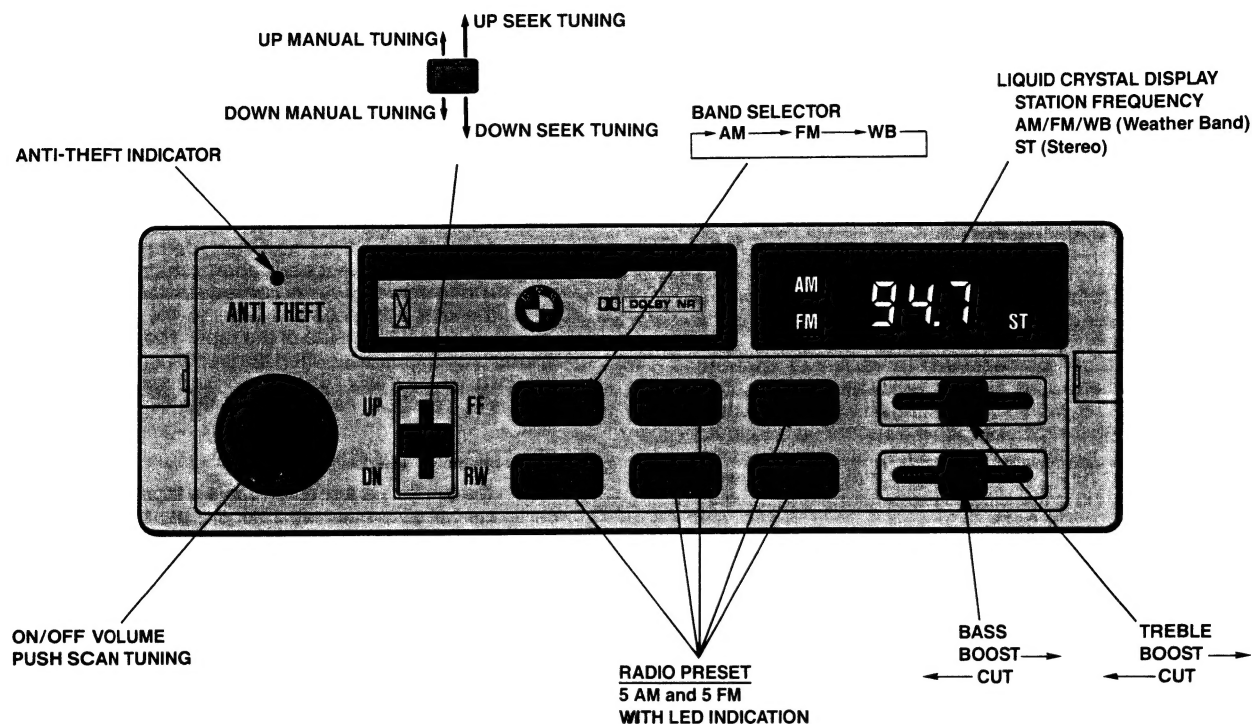
11. ROTATING TAPE HEAD

The rotating tape head in your tape cassette player ensures accurate horizontal tape alignment in both directions for optimum sound level reproduction and frequency response.

NOTE:

Your BMW ANTI-THEFT Radio contains a full logic computer controlled 3-motor drive which controls the automatic tape slack canceller (ATSC) and rotating tape head mechanism. During cassette tape loading/unloading or tape transport directional changes the operation of the motor drive emits an audible "precision like" mechanical sound which indicates normal tape cassette player operation.

3. USING THE RADIO



1. AM/FM/WB (Weather Band)

Pressing the **BAND** button causes "AM", "FM" or "WB" to appear on the display. The currently tuned frequency is also displayed when AM or FM is selected. "WB" indicates that the WB band is selected, and a weather broadcast frequency is automatically tuned without display of the frequency. A "beep" sounds if there are no weather band broadcasts available for reception. Manual tuning and seek tuning operations using the tuning lever can be employed to change to a frequency other than the one automatically tuned.

2. MANUAL/SEEK TUNING

The tuning lever employs 2-step operation. Raising or lowering the lever one step is used for manual tuning. Raising the lever increases the frequency, while lowering the lever decreases the frequency. Raising or lowering the tuning lever two steps (as far as it will go) activates the seek tuning operation. Raising the lever automatically tunes and locks onto the next higher receivable broadcast frequency, while lowering the lever tunes and locks onto the next lower receivable broadcast frequency.

3. SCAN TUNING

When the (on/off) volume control knob is pressed, scanning begins upscale from station to station, pausing seven seconds at each medium to strong frequency. Scanning stops when the volume knob is pressed again during the seven second pause.

4. STEREO

When a stereo station is received, the "ST" indicator will light up on the display. It will flash when the signal strength diminishes.

5. AUTOMATIC LOCAL/DISTANCE SWITCHING

New electronic circuitry automatically selects the local or distance mode for the best reception and eliminates the need for manual switching.

6. FM RECEPTION

FM reception will occasionally exhibit hissing and fluttering noises due to signal reflections or blockage by hills or tall buildings. FM signals strength diminishes rapidly after approximately 25 miles from the transmitter.

7. PROGRAMMING OR RE-PROGRAMMING PRESET RADIO STATIONS

- Tune in the desired radio station.
- Push the desired preset station selection for 1.5 seconds and an audible "beep" will sound indicating that the frequency has been memorized.
- Repeat this procedure for the remaining preset station selectors on both the AM and FM bands.

8. PRESET STATION INDICATORS

Each of the preset buttons has its own built-in LED. Pressing a preset button causes the color of the corresponding LED to change from orange to green to indicate selection of that preset frequency.

NOTE:

The radio programming controls have dual functions. Each button can be set to one AM and one FM station.

4. DISASSEMBLY

● Case

1. Insert and turn a flat screwdriver to remove case.
2. Raise case to remove.

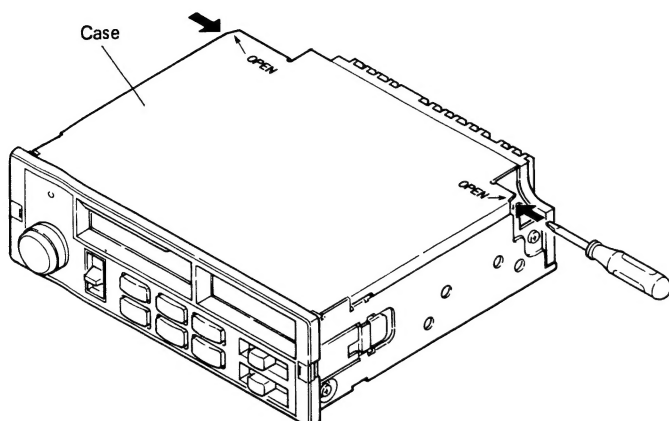


Fig. 1

● Cassette Mechanism Assy

1. Remove four screws, disconnect connector, and then raise cassette mechanism assy to remove.

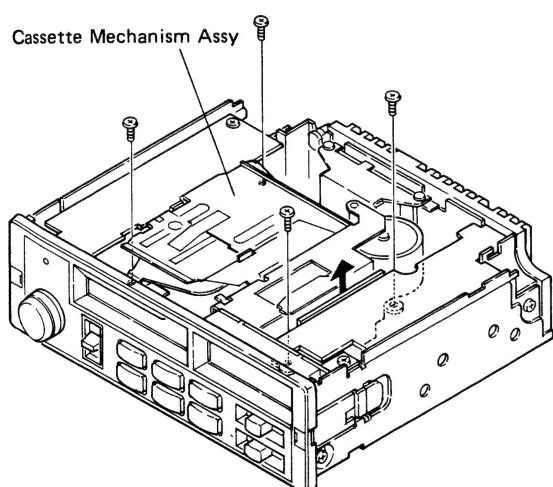


Fig. 2

● Grille Assy

1. Insert a screwdriver and turn it in the arrow direction, then two connector catches come off and the flexible circuit board can be removed.
2. Remove three knobs, and remove two screws.
3. Press tabs at two locations indicated by arrows, and pull out grille assy.

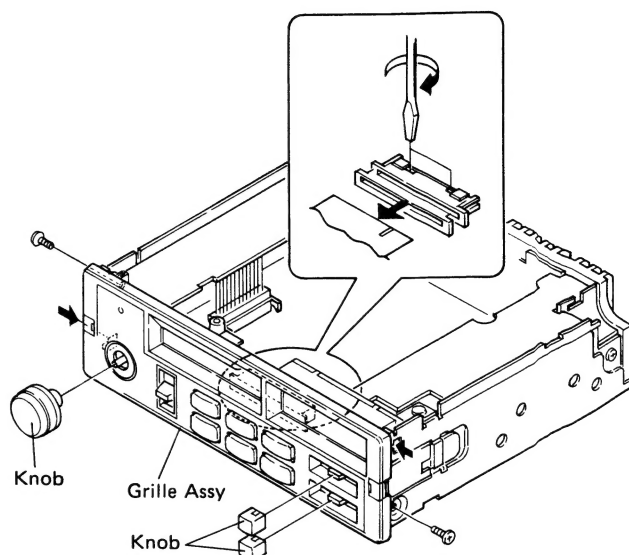


Fig. 3

● Chassis Unit

1. Remove four screws.
2. Unbend tabs at location indicated by arrow.
3. Raise up on tuner amp unit to remove it from chassis unit.

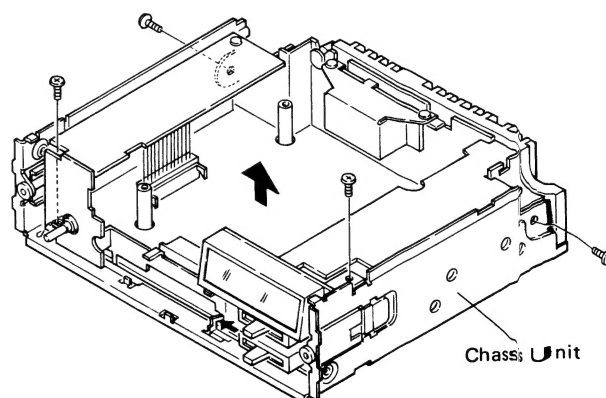


Fig. 4

5. ADJUSTMENT

- **Connection Diagram**

NOTICE:

Select C1 so that total capacity of 80pF attained from the direction of the receiver jack.

Z: Output impedance of SSG.

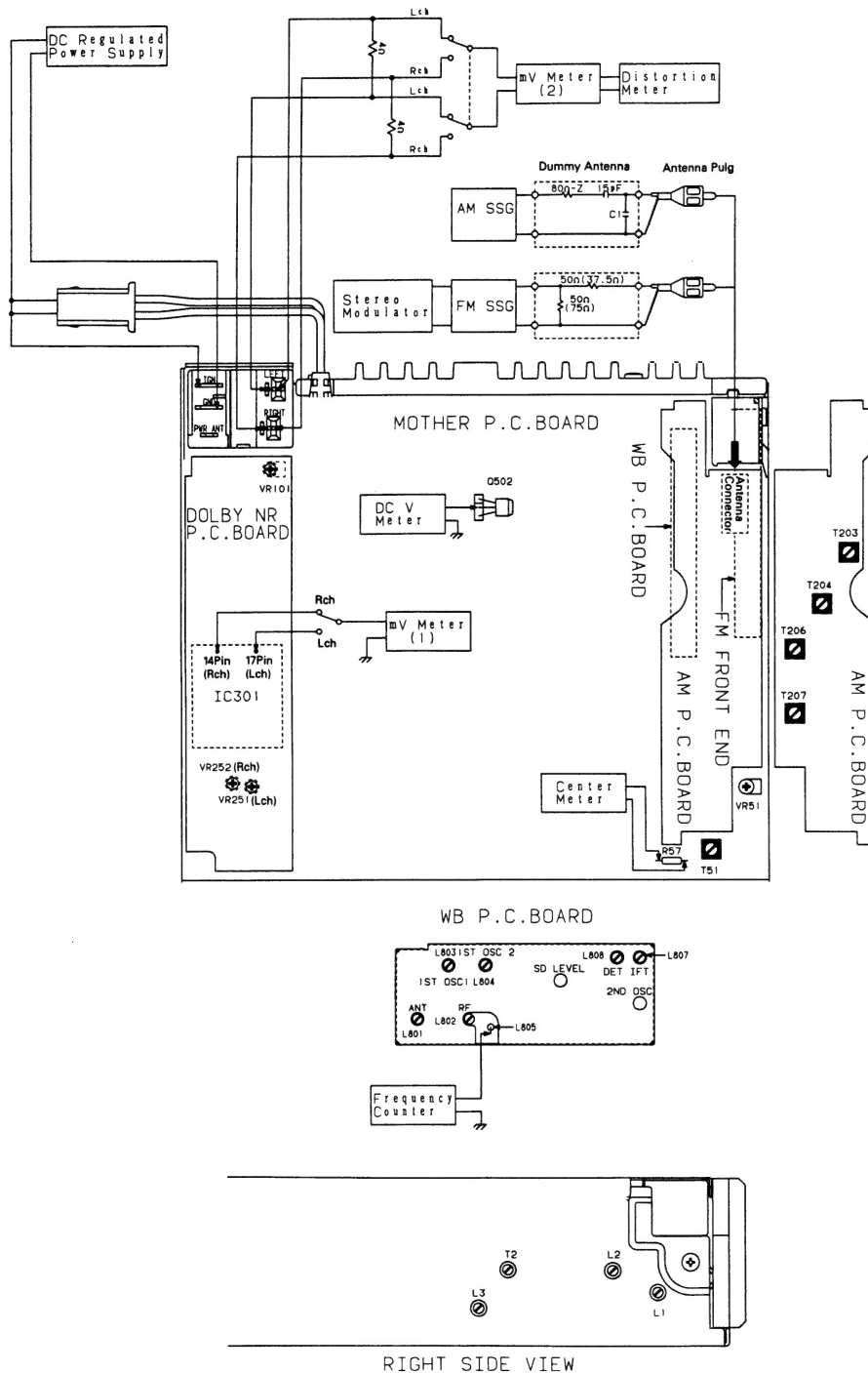


Fig. 5

5. 1 DOLBY NR LEVEL ADJUSTMENT

No.	Cassette Tape	Adjusting Point	Adjustment Method (Switch Position)
1	NCT-150 (400Hz, 200nwb/m)	VR251 (Lch), VR252 (Rch)	mV Meter (1): 300mV \pm 1dB (300mV = -8.24dBs) (DOLBY NR Switch: OFF)

5. 2 AM ADJUSTMENT

	No.	AM SSG (400Hz, 30%)		Displayed Frequency (kHz)	Adjusting Point	Adjustment Method (Switch Position)
		Frequency (kHz)	Level (dB)			
Tuning Volt	1			1,620	—	DC V Meter: Less than 8.5V
	2			530	—	DC V Meter: More than 0.8V
Tracking	1	600	20	600	T203, T204, T206, T207	mV Meter (2): Maximum
	2	600 1,000 1,400	35	600 1,000 1,400	—	The difference between the maximum and minimum output levels at 600kHz, 1,000kHz and 1,400kHz must be 6dB or less.

5. 3 FM ADJUSTMENT ※ Stereo MOD.: 1kHz, L+R = 90%, Pilot = 10%

	No.	FM SSG (400Hz, 100%)		Displayed Frequency (MHz)	Adjusting Point	Adjustment Method (Switch Position)
		Frequency (MHz)	Level (dB)			
IF	1	98.1 Unmodulated	60	98.1	T51	Center Meter: 0
Tracking	1	107.9	10	107.9	L3	DC V Meter: 7.0V \pm 0.1V
	2	87.9	10	87.9	—	DC V Meter: More than 1.5V
	3	90.1	10	90.1	L1, L2	mV Meter (2): Maximum
	4	98.1	10	98.1	T2	mV Meter (2): Maximum
MPX	1	98.1※	60	98.1	VR101	mV Meter (2): Best separation
ARC	1	98.1※	35	98.1	VR51	mV Meter (2): Separation 5dB

5. 4 WB ADJUSTMENT

	No.	FM SSG (400Hz, 100%)		Displayed Frequency (MHz)	Adjusting Point	Adjustment Method (Switch Position)
		Frequency (MHz)	Level (dB)			
WB	1				L803	Frequency Counter: 151.775MHz NOTE: After adjusting L803, disconnect frequency counter
	2	162.400	60	WB	Volume control knob	mV Meter (2): 10dBs
	3	162.400	60	WB	L808	Distortion Meter: Minimum
	4	162.400	60	WB	L807	Distortion Meter: Minimum
	5	Repeat No. 3, 4 alternately so that the distortion meter indicates minimum.				
	6	162.475	10—15	WB	L801, L802	mV Meter (2): Maximum
	7	162.475	10—15	WB	L804	mV Meter (2): Maximum
	8	If L804 is adjusted more than one quarter turn, repeat No. 1.				
	9	Repeat No. 6, 7 alternately so that the mV meter (2) indicates maximum output.				

ICs and Transistors

2SA1048
2SB808
2SC1740S
2SC2458
2SC3113
2SD1012



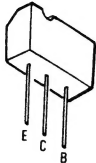
2SA933S
2SD1468S



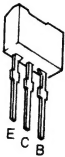
2SC2570
2SC2753



2SB822F



2SD1507MF



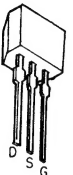
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2SD1276



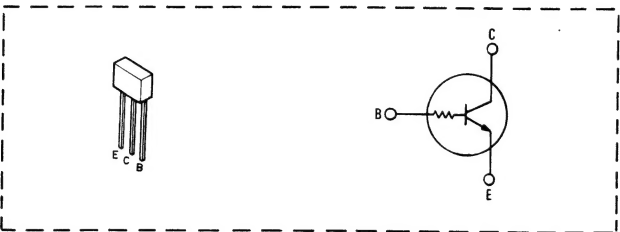
2SK241



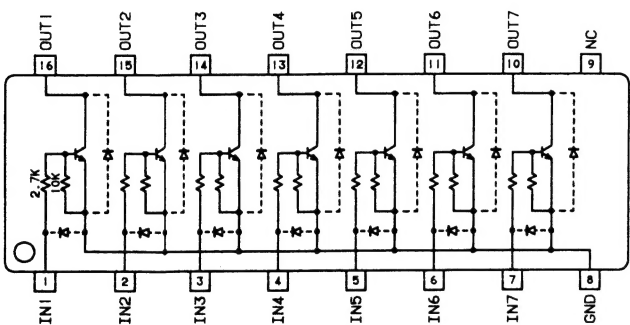
2SK435



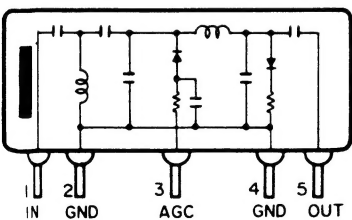
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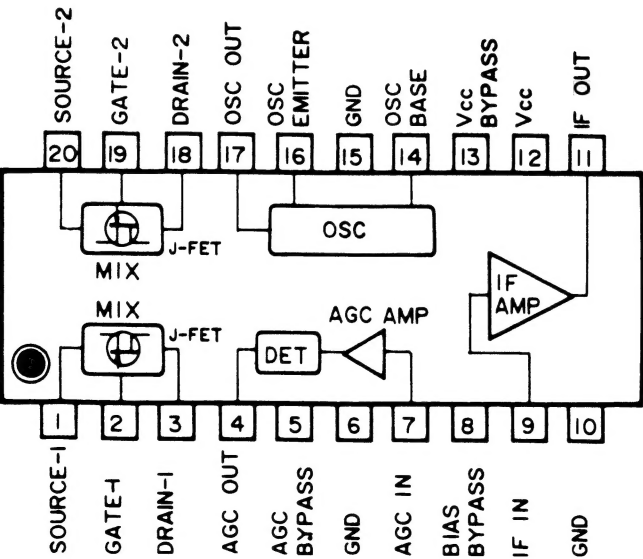
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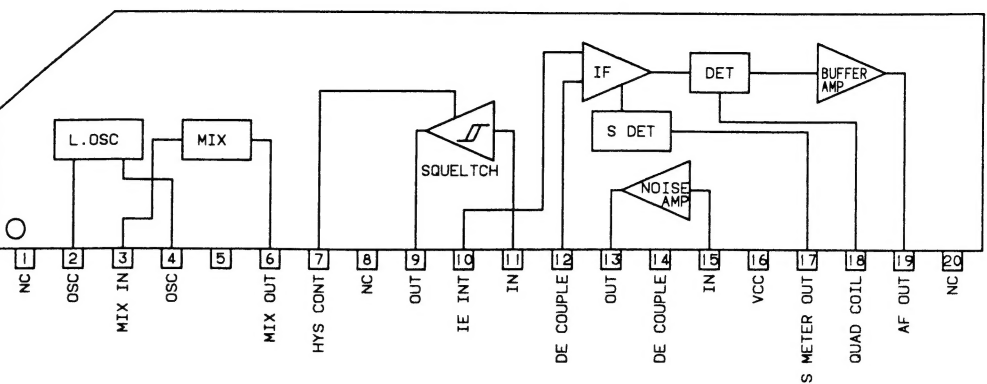
CWW1015
(CWW-173)



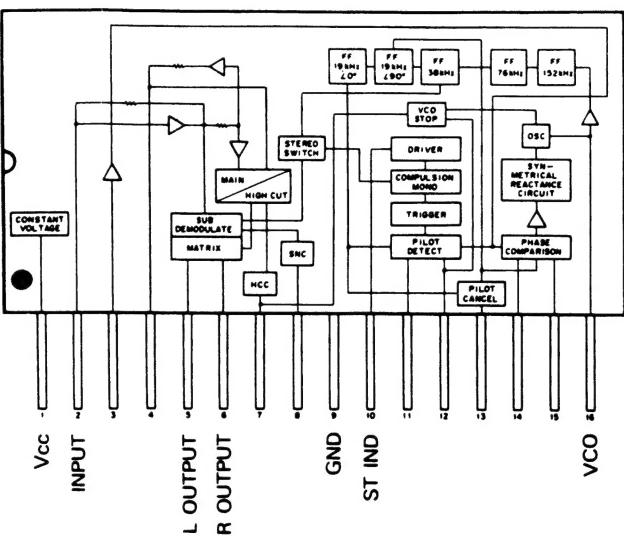
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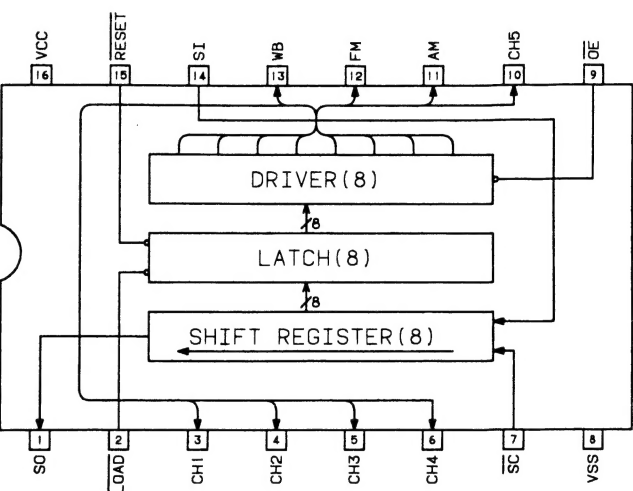
TK10483Z



LA3430P



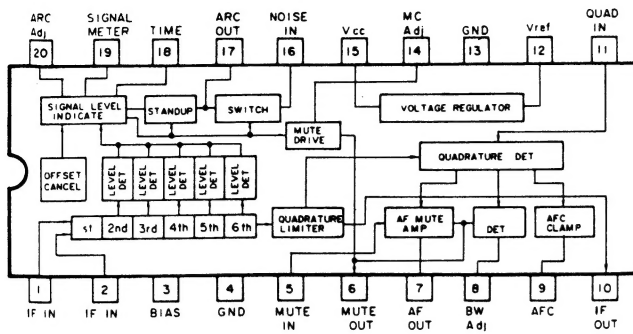
MB88307



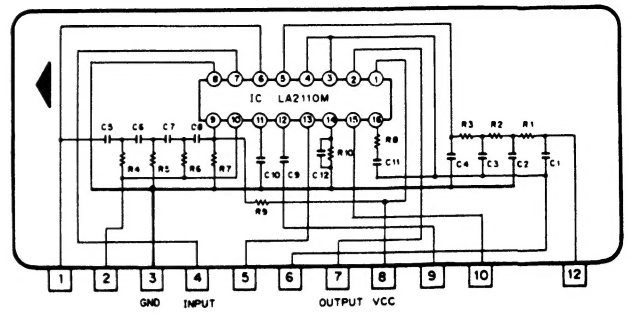
Pin Function (MB88307)

Pin No	Pin Name	I/O	Function and Operation
1	SO	Output	Serial data output.
2	LOAD	Input	"L" when active and a data load signal is input from the shift register to the latch. "H" when kept.
3	CH1	Output	Data input into pin 14 in serial form is output in parallel from via pins 3 - 13.
4	CH2		
5	CH3		
6	CH4		
10	CH5		
11	AM		
12	FM		
13	WB		
7	SC	Input	Shift clock input.
8	VSS	—	Ground.
9	OE	Input	Output port 3-state control input. "L" when output active. "H" during 3-state output.
14	SI	Input	Serial data input.
15	RESET	Input	Reset input. When "L", output latch becomes "H".
16	VCC	—	Power supply, +5V.

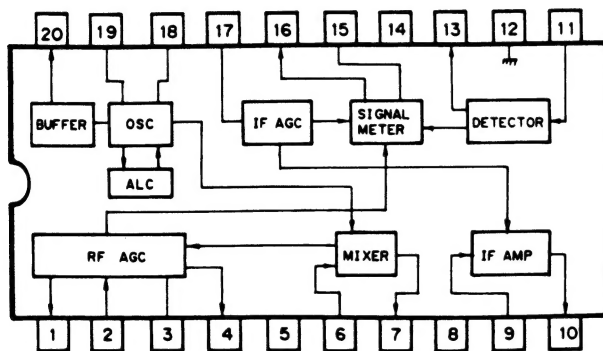
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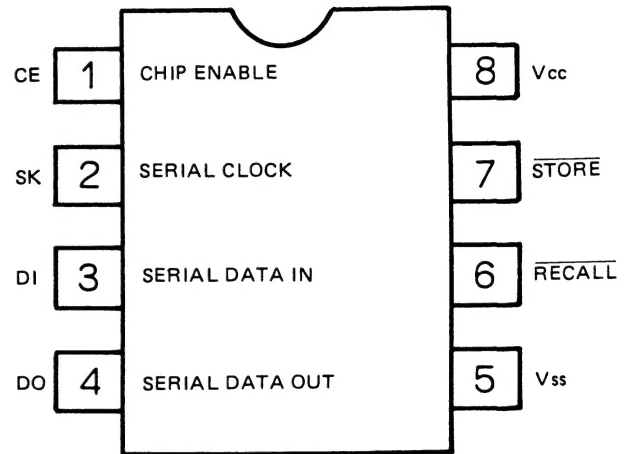
KHA115



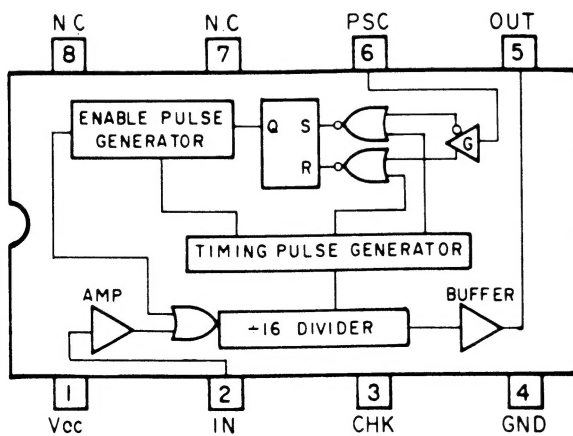
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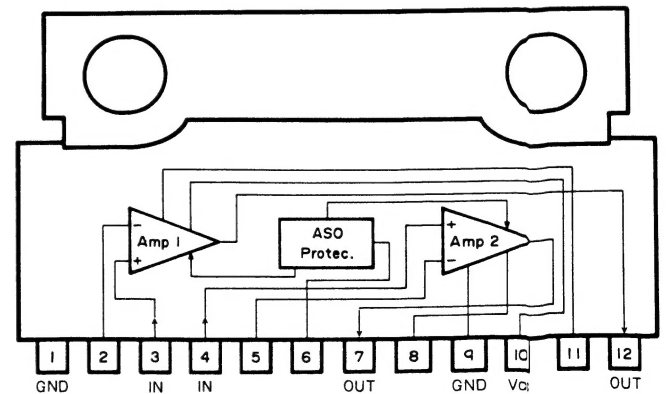
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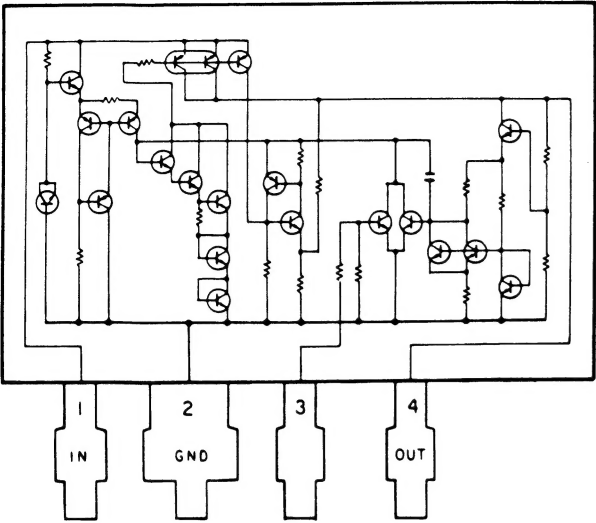
μPB553AC



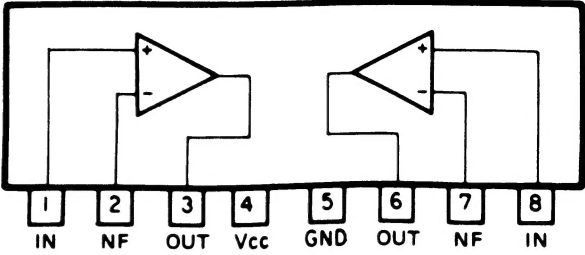
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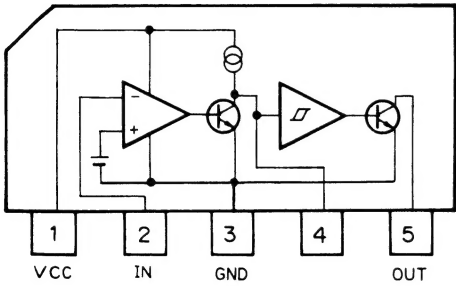
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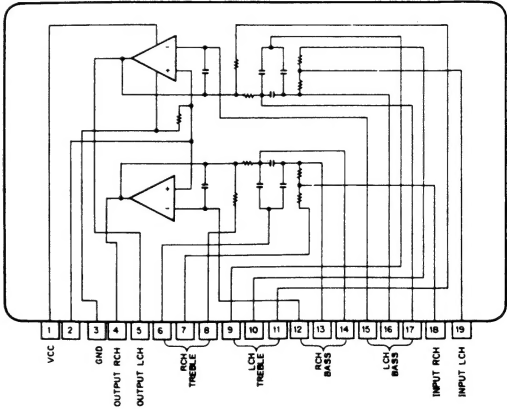
M51522AL



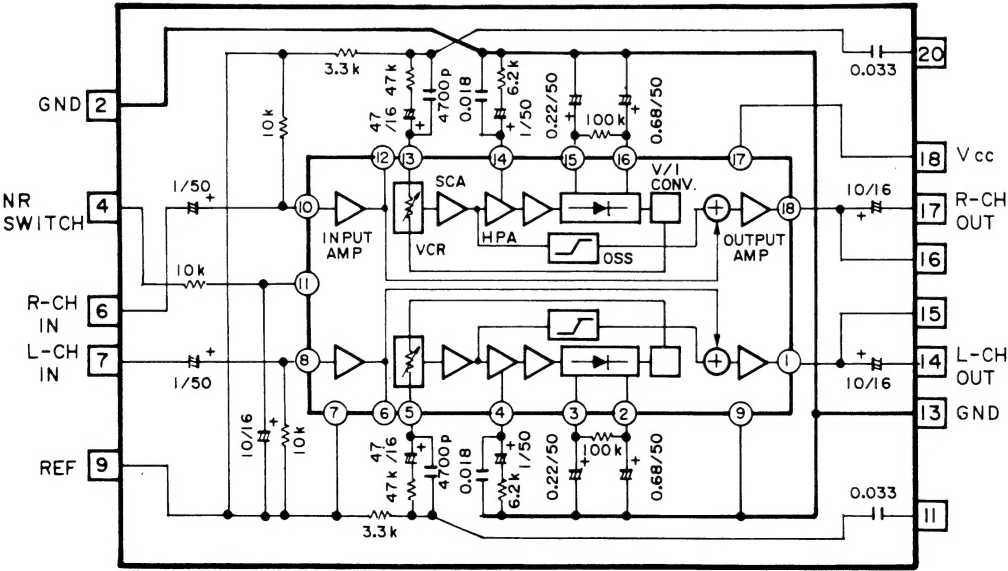
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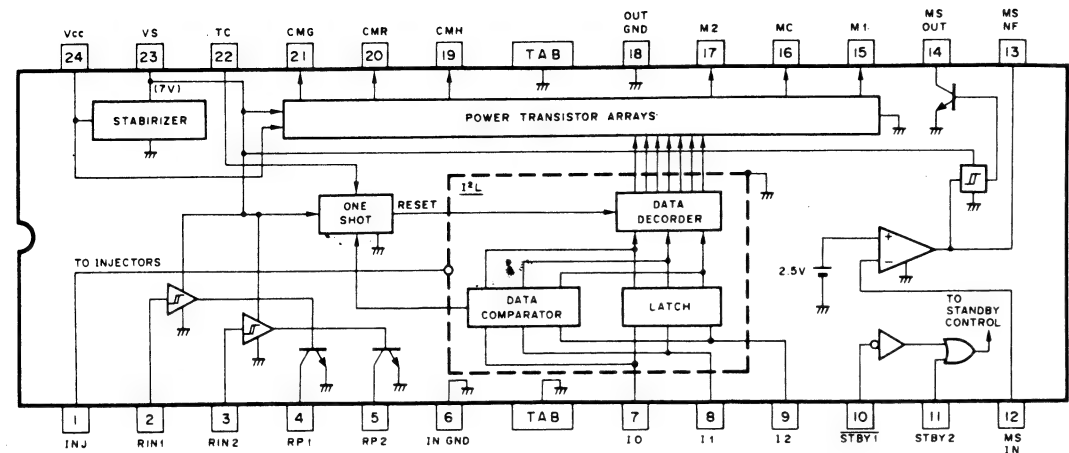


KHA125



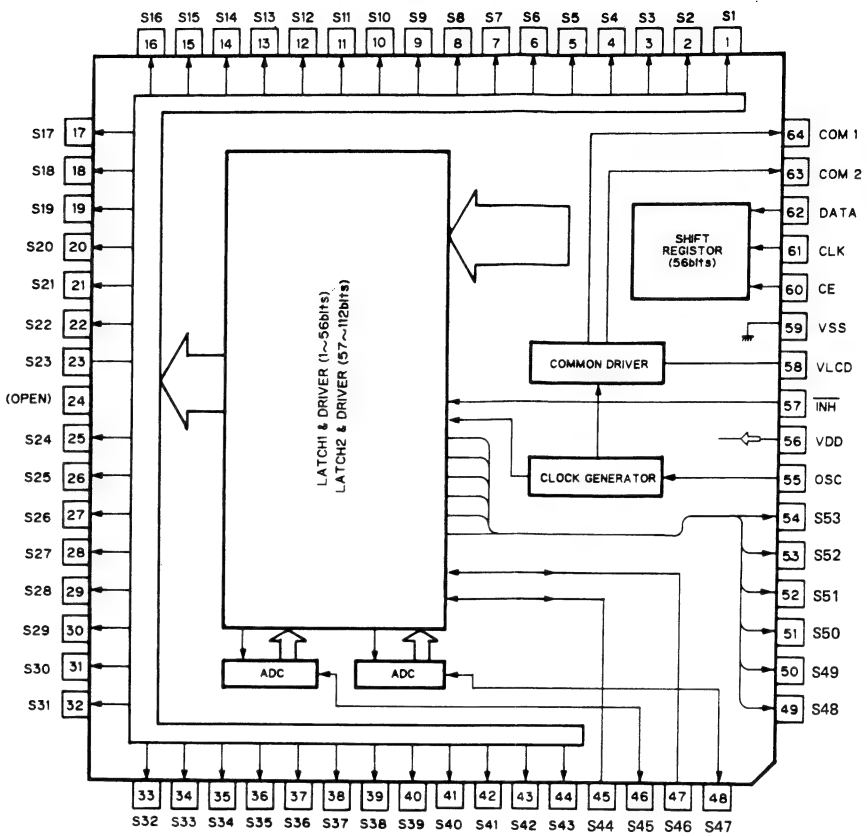
NR9200A





● PA3019(Deck Driver) Pin Function

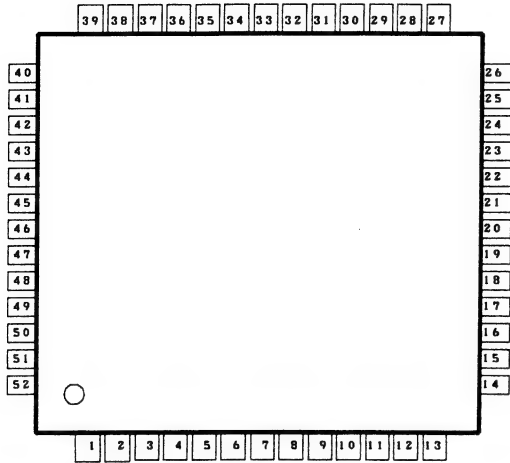
Pin No.	Pin Name	I/O	Function and Operation
1	INJ	Input	Power supply for internal logic (I ² L).
2	R IN 1	Input	Input terminal for Relay Table Rotation Sensor (MR1) signal.
3	R IN 2	Input	Input terminal for Relay Table Rotation Sensor (MR2) signal.
4	RP 1	Output	Waveform output of Relay Sensor Input 1 (2 Pin) signal.
5	RP 2	Output	Waveform output of Relay Sensor Input 2 (3 Pin) signal.
6	IN GND	—	GND terminal of small-signal series.
7	I 0	Input	Logic input terminal for motor control
8	I 1	Input	
9	I 2	Input	
10	STBY 1	Input	Standby control. At active "L" (0.7V or less), the IC current is switched OFF.
11	STBY 2	Input	Standby control. At active "H" (3.5V or more), the IC current is switched OFF.
12	MS IN	Input	Amplifier input (inverted input) terminal for Music Sensing (MS).
13	MS NF	I/O	Output of the MS amplifier and input of the MS Schmitt circuit.
14	MS OUT	Output	Output of Schmitt circuit for MS. MS OUT outputs a pulse when the signal level of the MSNF terminal exceeds 0dBm or enters OPEN status when it is 0 dBm or less.
15	M1	Output	+ terminal drive output of motor M1 for the head table drive.
16	MC	Output	Drive output of the common terminal of motors M1 and M2.
17	M2	Output	+ terminal drive output of drive motor M2 of the FF/REW selecting gear.
18	OUT GND	—	GND terminal of the motor drive circuit.
19	CMH	Output	H (+) terminal drive output of capstan motor M3. Output voltage: During speed control = approx. Vcc-1.7V During LOAD or EJECT = 6.9V
20	CMR	Output	R terminal drive output of capstan motor M3. (1) During speed control: OPEN (2) During LOAD: approx. 0V (3) During EJECT: approx. 7V
21	CMG	Output	GND (—) terminal drive output of capstan motor M3. (1) During speed control: approx. 0V (2) During LOAD/EJECT: OPEN
22	TC	Output	Connecting terminal of capacitor for setting the timer that switches OFF the power transistor for constant motor drive at a change in logic input I0, I1, I2.
23	VS	Output	Power supply for relay table rotation sensor. Approx. 7V.
24	Vcc	Input	Power supply terminal for IC.



● Pin Functions (LC7580)(LCD Driver)

Pin No.	Pin Name	I/O	Function and Operation
1 23	S1 S23	Output	Segment signal output terminal to LCD. LCD display performed using COM1, COM2 matrices.
24	OPEN	—	Not connected.
25 54	S26 S53	Output	Segment signal output terminal to LCD. LCD display performed using COM1, COM2 matrices.
55	OSC	Input	Terminal for clock generator.
56	VDD	Input	Power supply terminal.
57	INH	Input	Input terminal for setting LCD display off.
58	VLCD	Input	Input terminal for setting LCD bias voltage.
59	VSS	—	Power supply terminal. Connect to GND.
60 61 62	CE CLK DATE	Input	Input terminal for serial data transfer.
63 64	COM2 COM1	Output	Common signal terminal to LCD.

*PD4081D



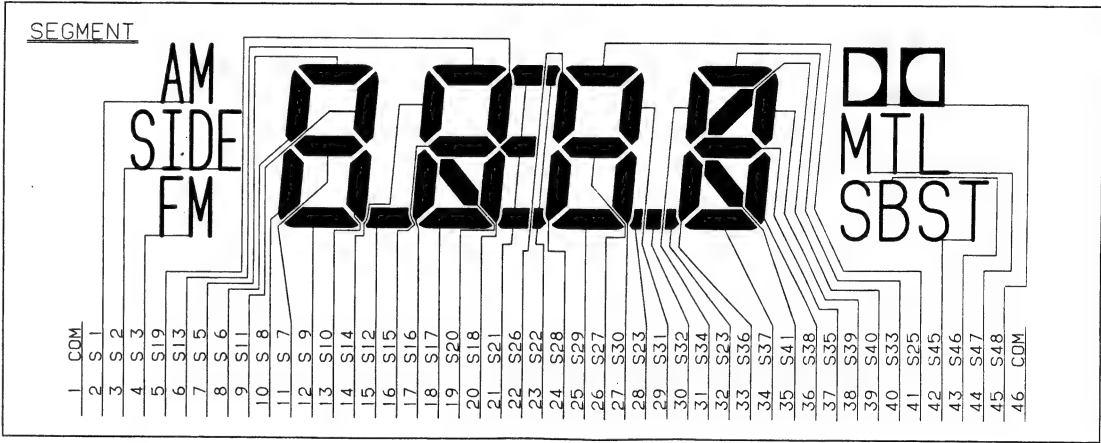
IC's marked by * are MOS type.
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

● Pin Function (PD4081D)

Pin No	Pin Name	I/O	Function and Operation
1	TAPE	Output	Turns TAPE power supply on when "H".
2	CE24	Output	Transfers data with IC702 when "H".
3	CE12	Output	When signal switches form "H" to "L" then back to "H", data is set in IC703.
4	PEE	Output	Beep output.
5, 6	XO, XI	—	Terminals for connection with 4.5MHz crystal oscillator.
7, 8	VDD	—	Power supply terminals (5V)
9	POWER	Input	Detects status of power switch. "H" when ON.
10	ACC	Input	Detects status of ACC power supply. "H" when ON.
11	BACK UP	Input	Detects status of back up power supply. "H" when ON.
12, 13	GND	—	Ground.
14	NC	—	Not connected.
15, 16	E01, E02	Output	PLL error outputs.
17	CE	Input	Input for pulses from back up power supply detection circuit.
18	FM	Input	Programmable counter input. Receives input from prescaler.
19	AM	Input	Same as 18 about.
20	PSC	Output	Pulse swallow control output.
21	GND	—	Ground.
22	STANDBY	Output	"H" when IC601 is in standby status. "L" when tape is operating
23	DOLBY NR	Output	"H" when Dolby NR is on.
24	ANTI-1	Output	Causes LED to flash when Anti-Theft is operating.
25	ANTI-2	Output	"H" when "Anti-Theft" is displayed.
26	MS	Input	MS input.
27	I2	Output	IC601 control data terminal.
28	I1	Output	
29	I0	Output	
30	SO	Output	Serial data output.
31	SCK	Output	Serial clock signal output.
32	SI	Input	Input for serial data from IC702.
33	VDD	—	Power supply terminal. (5V)
34	END2/SD	Input	Tape mode: Reverse tape end pulse detection terminal. Tuner mode: SD signal input terminal. "H" when a station is tuned in.

Pin No	Pin Name	I/O	Function and Operation
35	END1/ST	Input	Tape mode: Forward tape end pulse detection terminal Tuner mode: ST signal input terminal. "H" when a stereo broadcast is being received.
36	MUTE	Output	Mute signal output. "H" when mute is on.
37	CM STOP	Ouptut	Capstan motor stop terminal when in tape mode. "H" When the capstan motor is stopped.
38	MTL/LOC	Output	Tape mode: Tape equalizer amplifier switching terminal. "H" when in metal position. Tuner mode: "H" during seek operation.
39	K3	Input	Key return input.
40	K2		
41	K1		
42	K0		
43	Sg	Output	Key strobe output.
44	Sf		
45	Se		
46	Sd		
47	Sc		
48	Sb		
49	Sa		
50	CE75	Output	Chip enable output for IC901 (LCD driver).
51	PLAY	Output	"L" during tape play.
52	INH	Output	Turns LCD display on and off. "L" when LCD display

● LCD (CWW1012)



NOTE:COM terminal connects to all elements.

fig .6

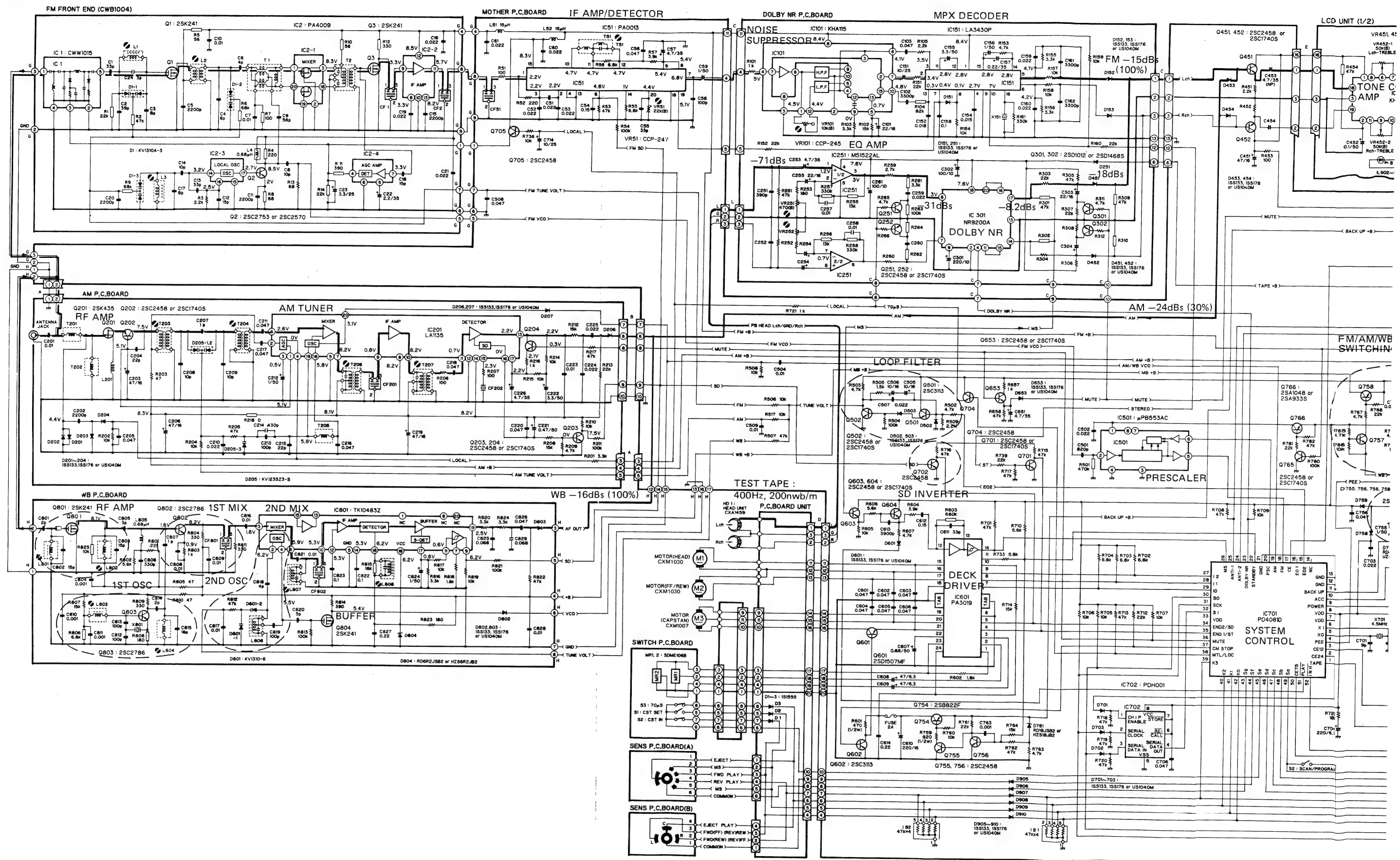
6. SCHEMATIC CIRCUIT DIAGRAM

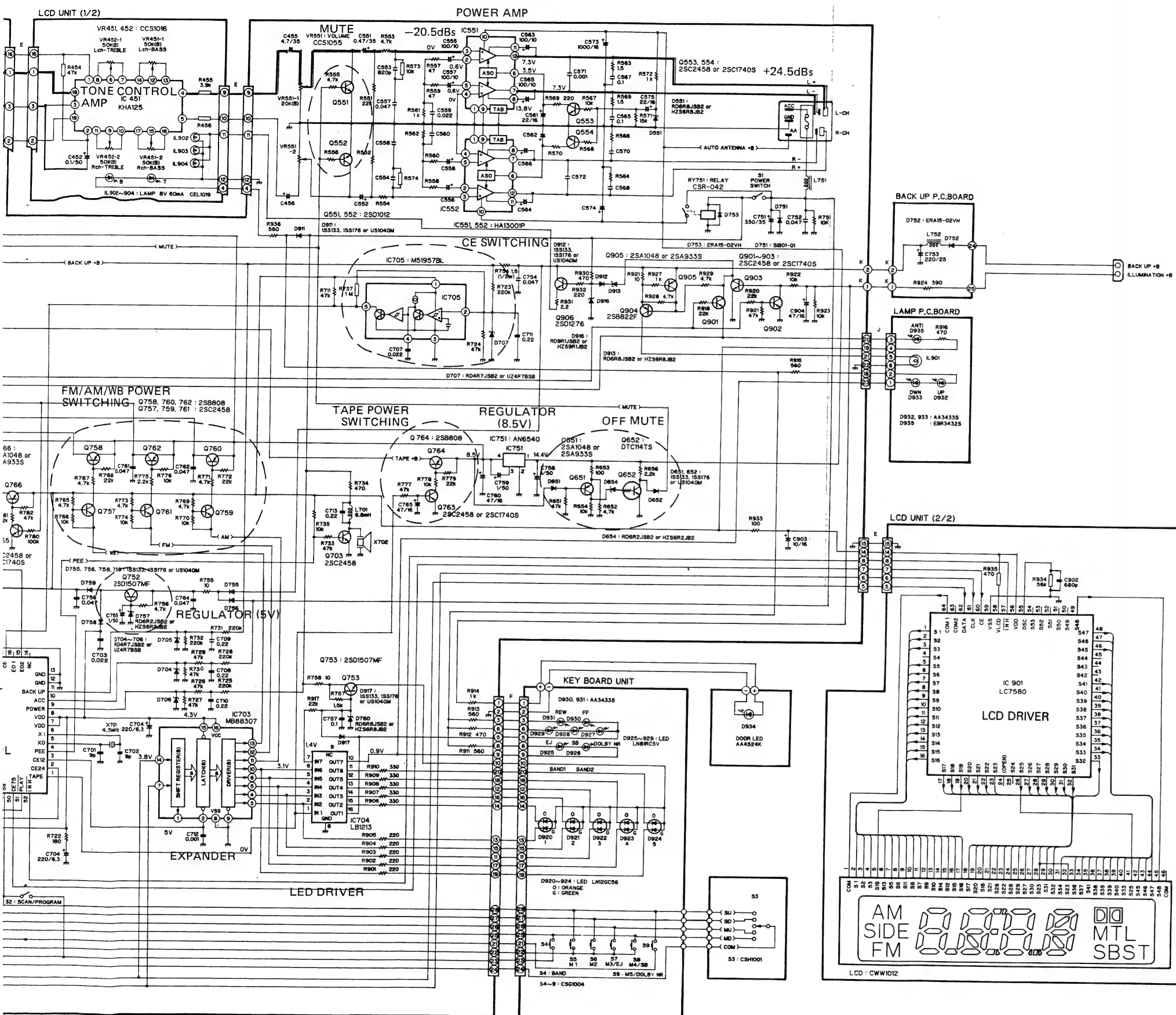
A

B

C

D





NOTE
 —○— Indicates a chip resistor.
 —■— Indicates a chip capacitor.
 —□— Indicates a chip inductor.

SWITCHES:

● Switch P.C. Board

S1: CST SET SWITCH ON—OFF
 S2: CST IN SWITCH ON—OFF
 S3: 70μS SWITCH ON (120μS)—OFF (70μS)
 The under lined indicates the switch position.

Tuner Amp Unit(KE-81ZBM-02)

- Consists of
- Mother P.C.Board
- AM P.C.Board
- WB P.C.Board
- Dolby NR P.C.Board
- Lamp P.C.Board
- Back Up P.C.Board
- FM Front End(CWB1004)

Fig. 7

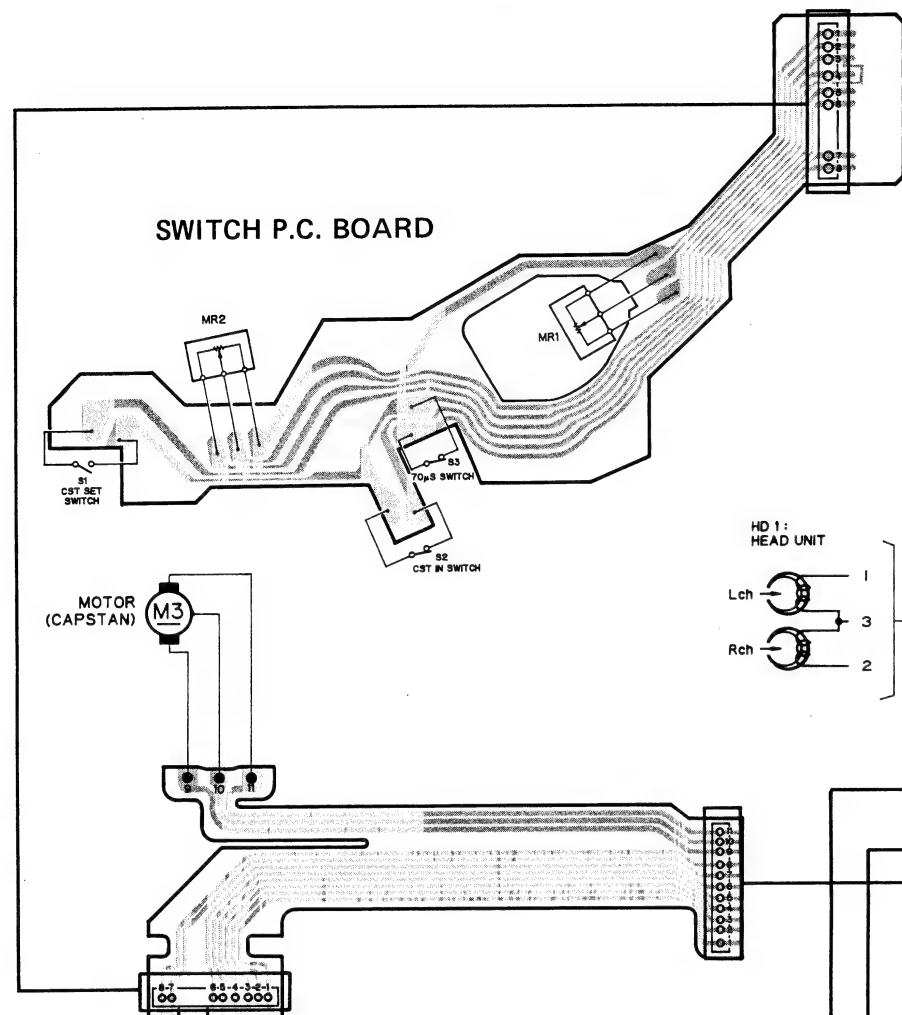
7. CONNECTION DIAGRAM

A

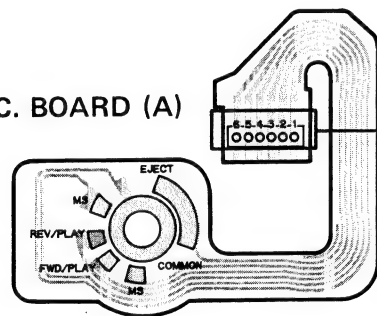
B

C

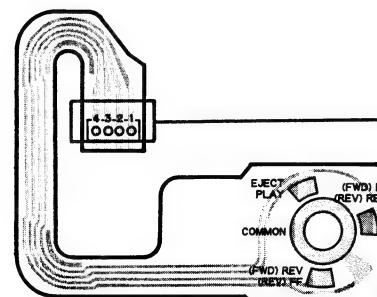
D



SENS P.C. BOARD (A)

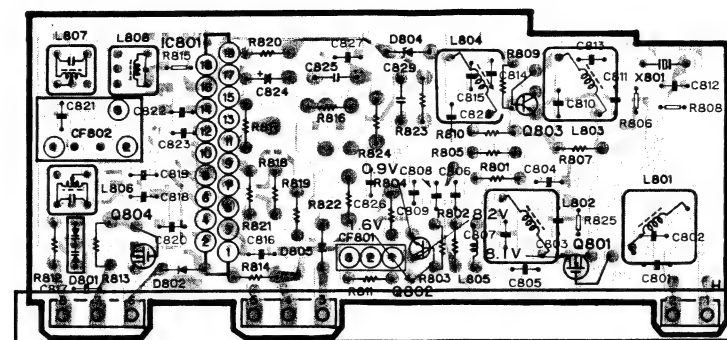


SENS P.C. BOARD (B)

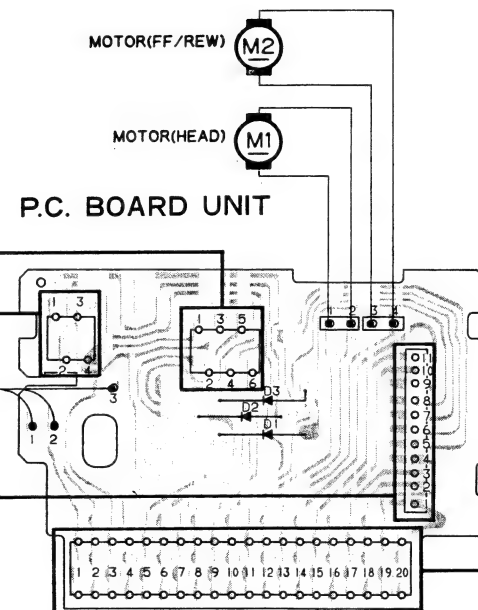


WB P.C. BOARD

IC, Q Q804 IC801 Q802 Q803 Q801
 ADJ L807 L808 L804 L802 L803 L801
 L806

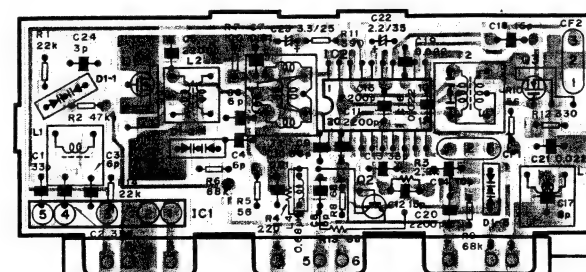


P.C. BOARD UNIT



FM FRONT END (CWB1004)

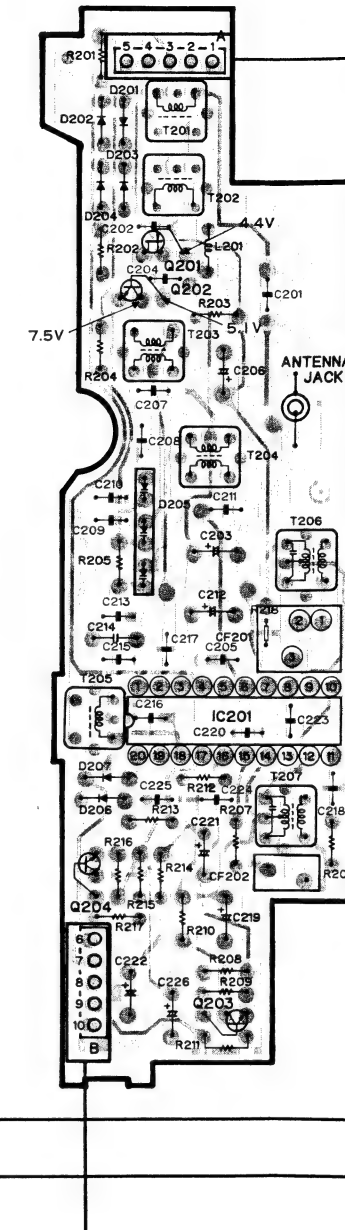
Q, IC IC1 Q1 Q2 IC2 Q3
 ADJ. L1 L2 T2 L3



IC1: CWV-173 Q1: 2SK241-GR D1: KV1310A-3
 IC2: PA4009 Q2: 2SC2753 or 2SC2570 Q3: 2SK241-Y

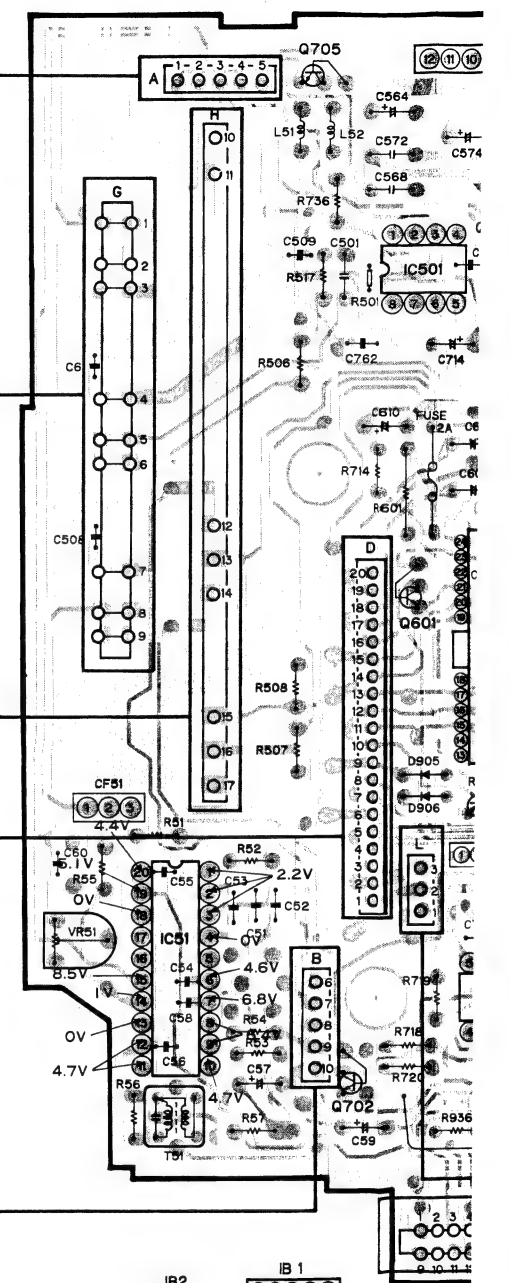
AM P.C. BOARD

Q204 IC, Q Q202 Q201 IC201 Q203
 ADJ T205 T204 T206 T207
 T203



MOTHER P.C. BOARD

IC, Q IC51 Q705 Q702 Q601 IC7
 ADJ VR51 T51



WB P.C. BOARD: IC801

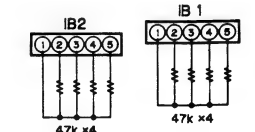
1	2	3	4	5	6	7	8	9	10
	6.2V	1.6V	5.5V	0V	5.9V			6.2V	5.3V
11	12	13	14	15	16	17	18	19	20
0.6V	5.3V		5.3V		6.2V	0.6V	6.2V	2.5V	

FM FRONT END: IC2

1	2	3	4	5	6	7	8	9	10
	0V	8.3V			0V	3.3V	3.3V	3.3V	0V
11	12	13	14	15	16	17	18	19	20
5.7V	8.5V	8.2V	3.2V	0V	2.5V	2.7V		0V	

AM P.C. BOARD: IC201

1	2	3	4	5	6	7	8	9	
5.1V	V	0.5V	0V	0V	2.6V	8.2V	8.2V	0.8V	8.
11	12	13	14	15	16	17	18	19	
0.7V	0V	2.2V	8.2V	2.3V	0V	2.2V	5.8V	5.8V	3

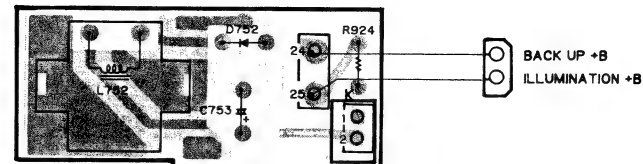
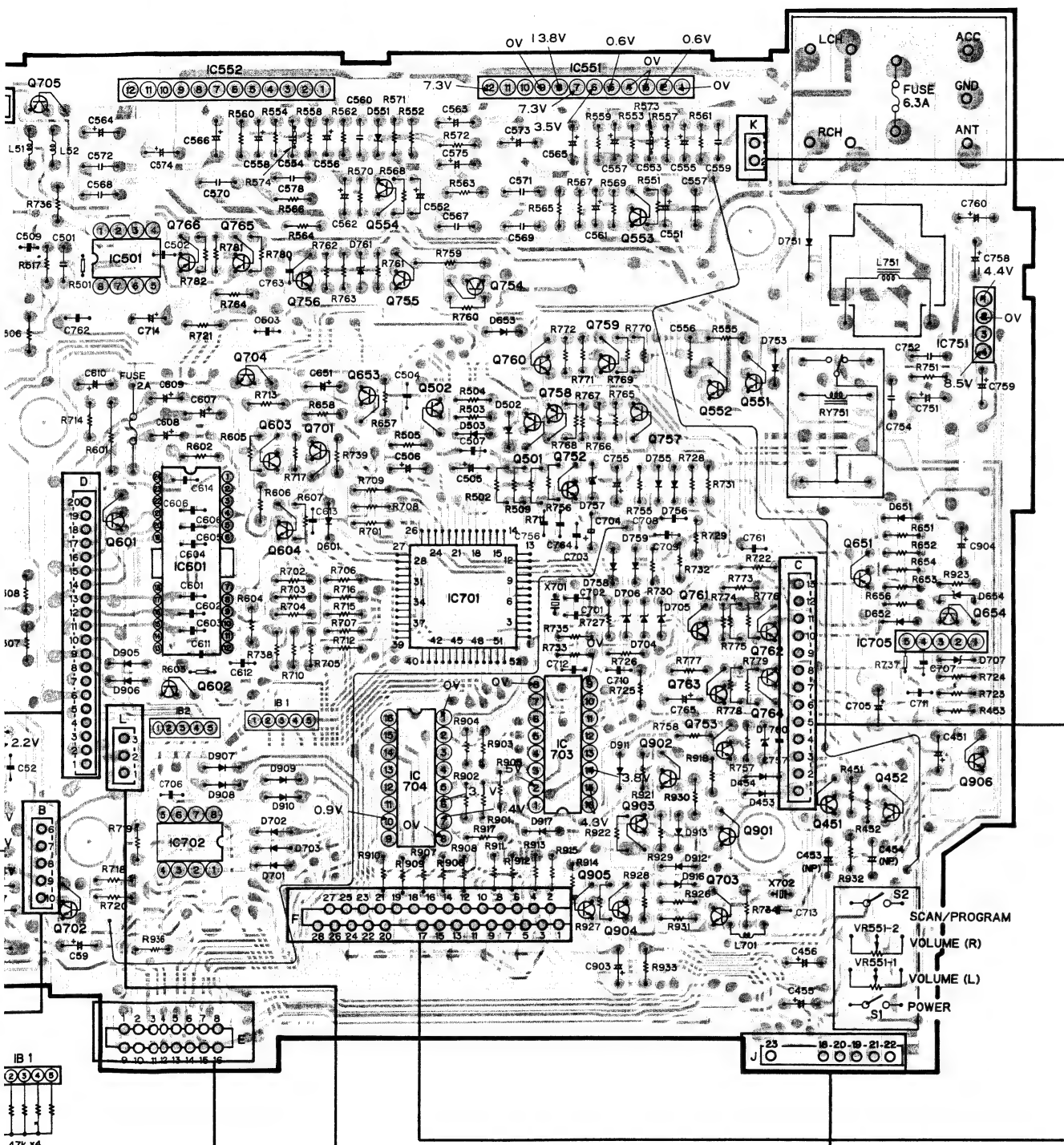


BOARD

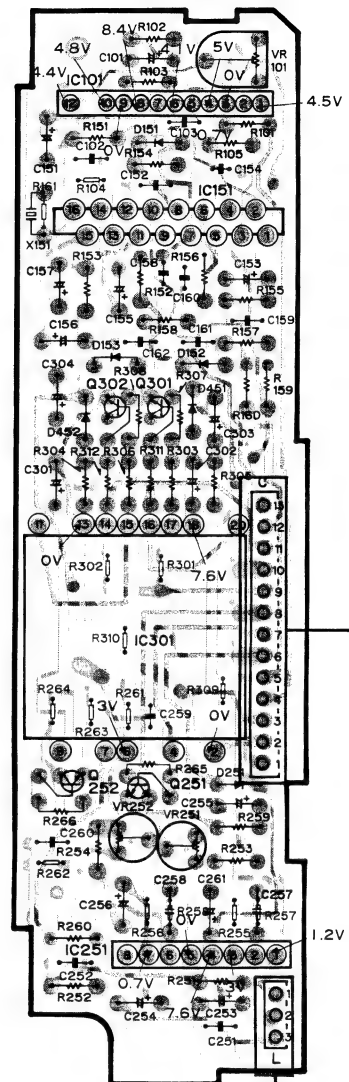
BACK UP P.C. BOARD

DOLBY NR
P.C. BOARD

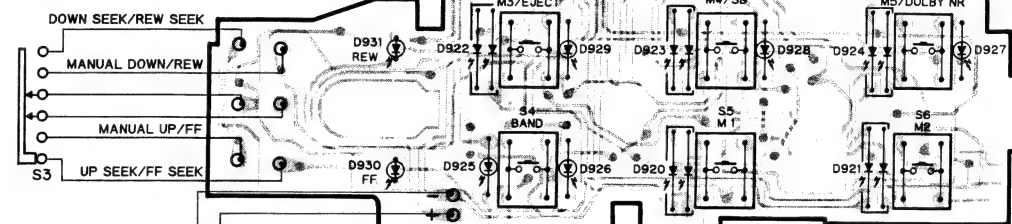
IC501 IC552 Q701 Q752 Q903 Q757 Q553 Q763 Q762 Q766 Q765 Q704 Q756 Q554 Q502 Q754 Q760 IC703 Q905 Q904 Q753 Q901 Q705 Q702 Q601 IC702 Q602 Q603 Q604 Q653 Q755 IC704 IC701 Q501 Q758 Q759 Q902 Q761 Q703 Q764 Q451 Q651 Q452 IC705 Q906



Q252 IC301 Q302 Q251 IC251 IC Q IC101 Q301 IC151 ADJ VR252 VR251 VR101

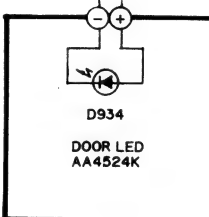


KEY BOARD UNIT

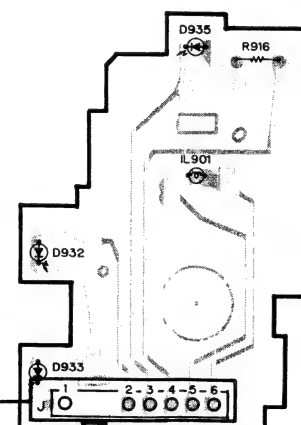


DOLBY NR P.C. BOARD:IC151

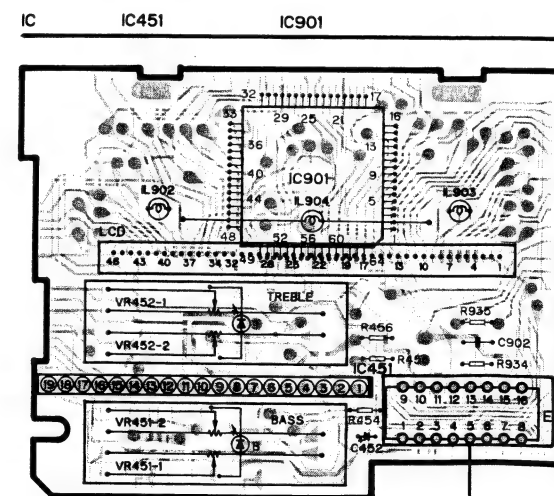
1	2	3	4	5	6	7	8
8.4V	3.4V	3.5V	2.7V	4.1V	4.2V	0.4V	0.1V
9	10	11	12	13	14	15	16
0V	7V	2.8V	2.8V	0.3V	2.8V	2.8V	



LAMP P.C. BOARD



LCD UNIT



7	8	9	10
8.2V	8.2V	0.8V	8.2V
17	18	19	20
2.2V	5.8V	5.8V	3.1V

Fig. 8

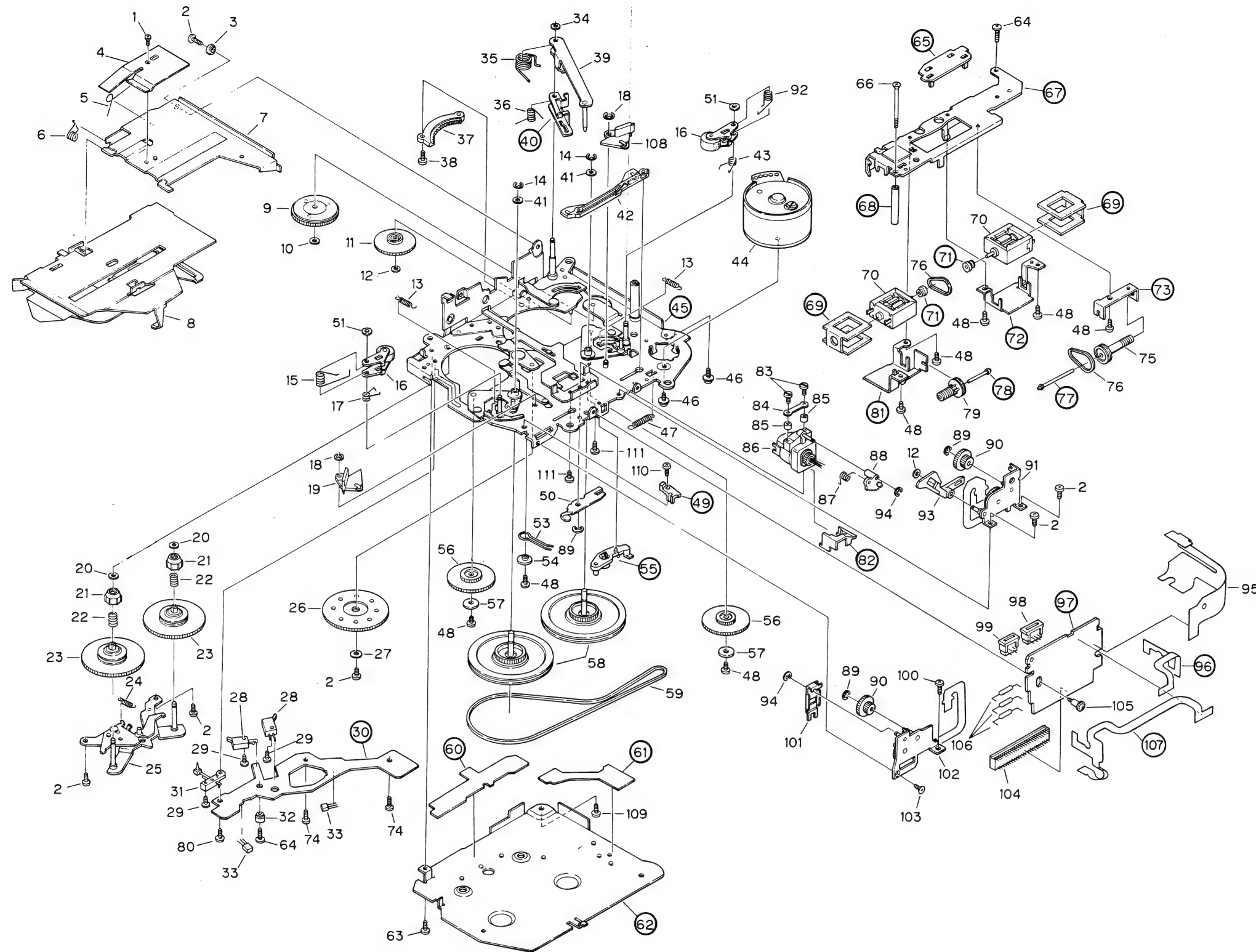
A

B

C

D

8. CASSETTE MECHANISM EXPLODED VIEW



● Parts List

NOTE:

- For your parts list, mark parts with ★★ as a GENERAL part. This classification is based on the model number.
- Parts whose length is longer than 100mm.

Mark No.

1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
★★	16
★★	17
★★	18
★★	19
★★	20
★★	21
★★	22
★★	23
★★	24
★★	25
★★	26
★★	27
★★	28
★★	29
★★	30
★★	31
★★	32
★★	33
★★	34

Fig. 9

● Parts List

NOTE:

- For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.
- ★★: GENERALLY MOVES FASTER THAN ★.
- This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- Parts whose parts numbers are omitted are subject to being not supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1	HBA-147	Screw M1.4×1.4		35	CBH-887	Spring
	2	BMZ20P040FMC	Screw		36	CBH-886	Spring
	3	CLB-663	Bush		37	CNV1075	Gear
	4	CBL1043	Spring		38	CBA1004	Screw M2×6
	5	CBH-867	Spring		39	CXD-389	Arm Unit
	6	CBH-837	Spring		40		Arm
	7	CNC1597	Arm		41	HBH-179	Washer
	8	CXA2164	Holder Unit		42	CNV1257	Lever
	9	CXA2088	Gear Unit		43	CBH-833	Spring
	10	CBF1024	Washer	★★	44	CXM1007	Motor (Capstan)
	11	CNY-271	Gear		45		Chassis Unit
	12	CBF-126	Washer		46	PMS26P025FMC	Screw
	13	CBH-835	Spring		47	CBH-830	Spring
	14	CBG1003	E Type Washer		48	HBA-175	Screw M2×2.5
	15	CBH-832	Spring		49		Spacer
★★	16	CXA1445	Pinch Roller Unit		50	CBL1050	Spring
	17	CBH-834	Spring		51	CBF1025	Washer
	18	YE25FUC	E Type Washer		52	
	19	CNV1254	Arm		53	CBH-893	Spring
	20	CBF1022	Washer		54	CLA1110	Collar
	21	CNW-932	Collar		55		Clamper
	22	CBH-827	Spring		56	CNV1616	Gear
★★	23	CXD2089	Reel Unit		57	CLA1238	Collar
	24	CBH-868	Spring		58	CNV1572	Flywheel
	25	CXA1481	Bracket Unit	★★	59	CNT-111	Belt
	26	CNW-944	Gear		60		Insulator
	27	CLA1109	Collar		61		Insulator
★★	28	CSN1003	Switch (70 μS, CST IN)		62		Cover
	29	CBA1025	Screw M1.7×5.5		63	BMZ20P030FMC	Screw
	30		P.C. Board		64	CBA-172	Screw M1.7×5.5
★★	31	CSN-089	Switch (CST SET)		65		Holder
	32	CLA1170	Collar		66	CBA-165	Screw M2×25
	33	SDME106B	Magnetic Resistive Device		67		Guide
	34	CBF-046	Washer		68		Spacer
					69		Insulator

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
★★	70	CXM1030	Motor (FF/REW, Head Position)		93	CNV1495	Arm
	71		Pulley		94	YE15FUC	E Type Washer
	72		Bracket		95	CNP1227	P.C. Board
	73		Bracket		96		P.C. Board
					97		P.C. Board
	74	CBA1037	Screw M2×2.5		98	CKS1075	Connector (6P)
	75	CNV1255	Pulley		99	CKS1073	Connector (4P)
★★	76	CNT1010	Belt		100	BMZ20P060FMC	Screw
	77		Shaft		101	CNH-004	Arm
	78		Shaft		102	CXA1548	Holder Assy
	79	CNV1256	Pulley		103	HBA-209	Screw M2×2
	80	CBA1054	Screw M2×5		104	CKS-678	Connector (20P)
	81		Bracket		105	CBA1022	Screw M2×2×3
	82		Cover	★	106	1S1555	Diode
	83	CBA1055	Screw M1.4×8		107		P.C. Board
	84	CBE-114	Spring		108	CNV1253	Arm
	85	CNY-134	Azimuth Rubber		109	CBA1060	Screw M2×7
★★	86	CXA1459	Head Unit		110	CBA1015	Screw M2×4
	87	CBH-829	Spring		111	CBA1041	Screw M2×2.5
	88	CNW-939	Gear				
	89	YE12FUC	E Type Washer				
	90	CNV1262	Gear				
	91	CXA1546	Holder Assy				
	92	CBH-831	Spring				

9. CABINET EXPLODED VIEW

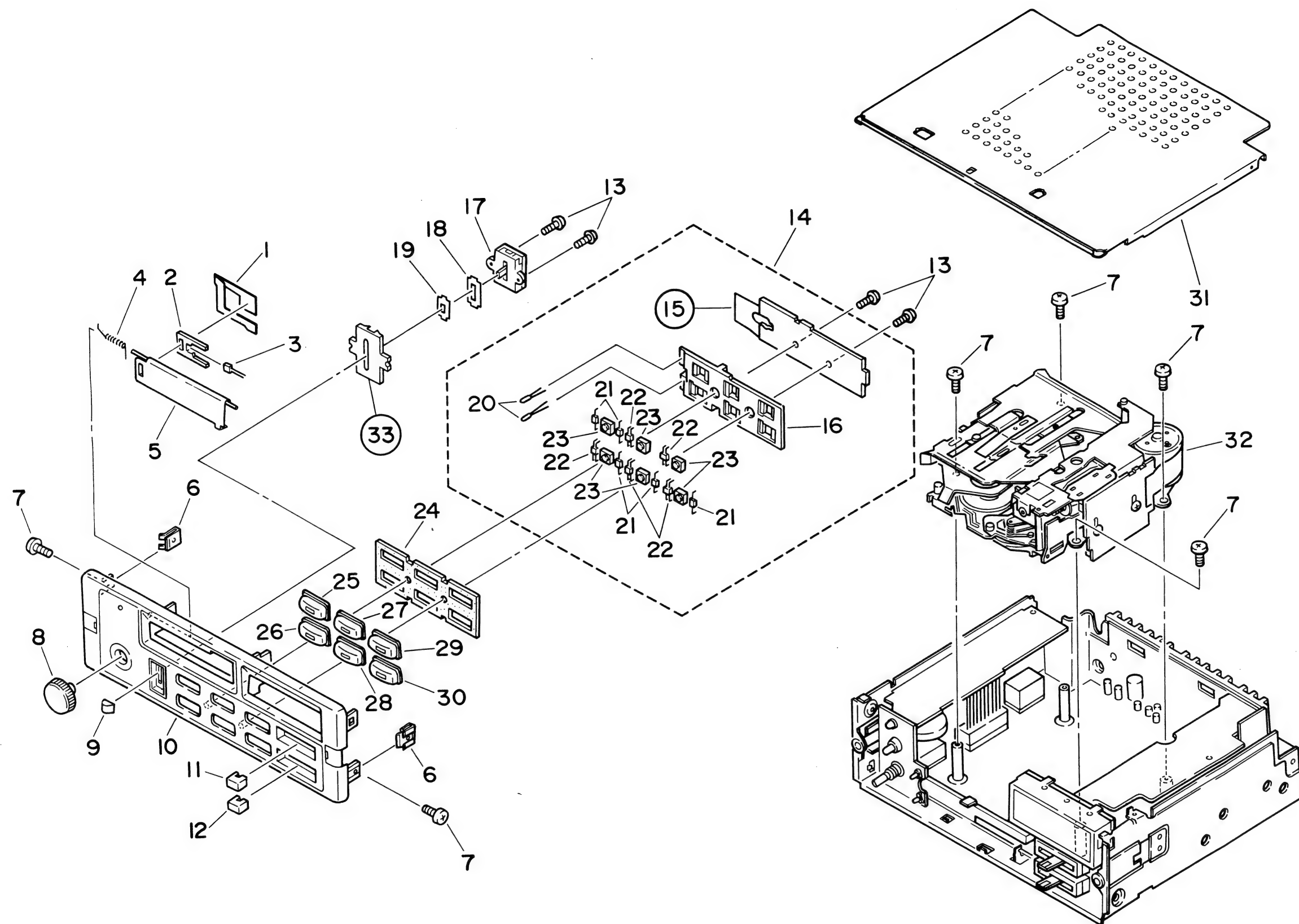
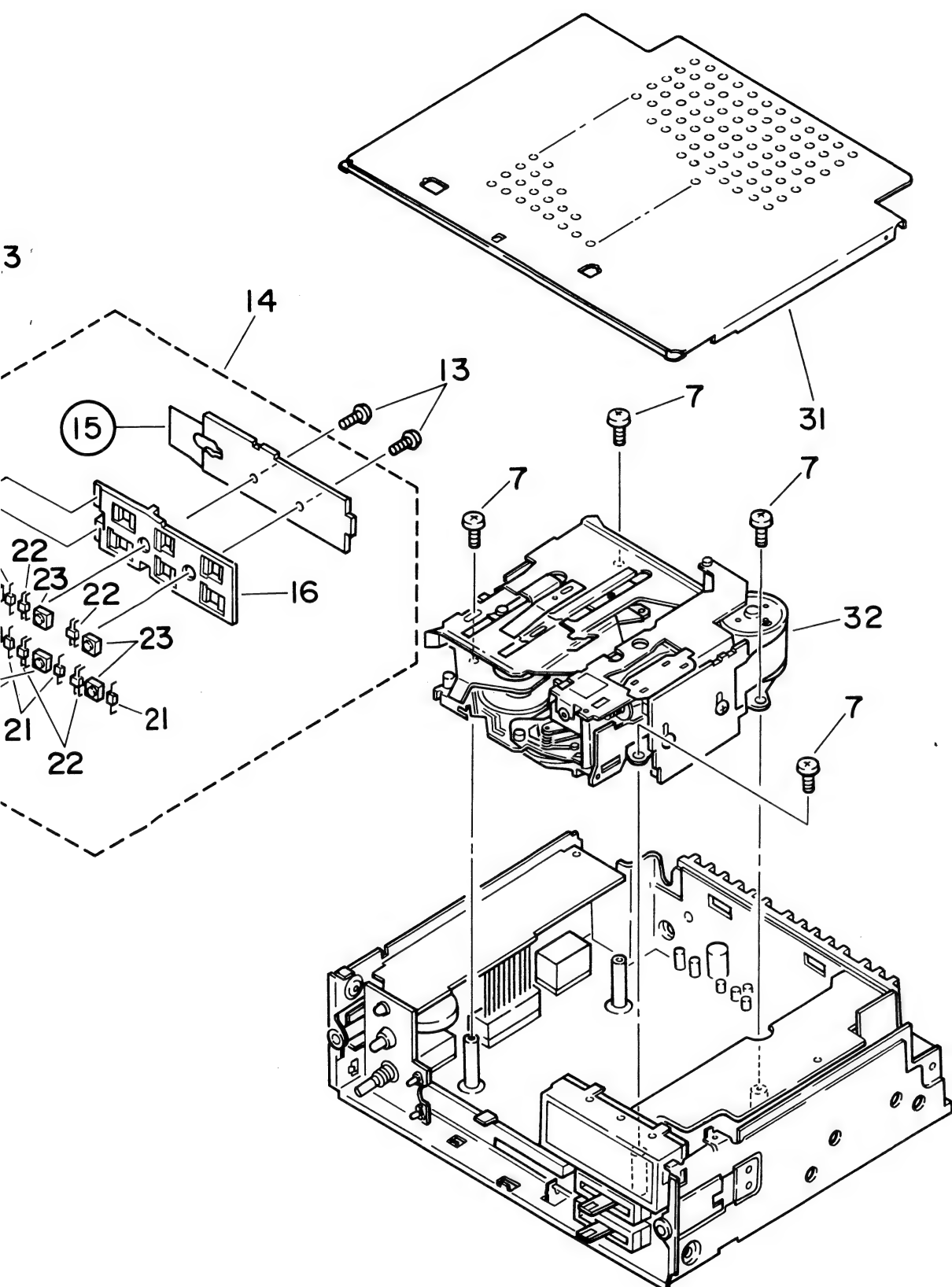


Fig. 10



• Parts List

Mark No.	Part No.	Description	Mark No.	Part No.	Description
1	CNP1278	P.C.Board	★ 21	LN81RC5V	LED
★ 2	CNS1181	Lens	★ 22	LN12GC56	LED
★ 3	AA4524	LED	★★ 23	CSG1004	Switch
4	CBH1081	Spring	24	CNM1080	Spacer
5	CAT1012	Door	★ 25	CAC1376	Button(BAND)
6	CNC1183	Holder	★ 26	CAC1373	Button(3)
7	BMZ26P050FMC	Screw	★ 27	CAC1371	Button(1)
★ 8	CAA1014	Knob(VOLUME)	★ 28	CAC1374	Button(4)
★ 9	CAC1077	Button(UP/DN)	★ 29	CAC1372	Button(2)
10	CXA1764	Grille Unit	★ 30	CAC1375	Button(5)
★ 11	CAC1377	Knob(T)	31	CXA1347	Case Unit
★ 12	CAC1378	Knob(B)	● 32	CXK1651	Cassette Mechanism Assy
13	BPZ20P060FZK	Screw	33		Lens
● 14	CWM1145	Key Board Unit			
15		P.C.Board			
16	CNV1103	Housing			
★★ 17	CSH1001	Switch			
18	CNM1345	Cover			
19	CNM1255	Cover			
★ 20	AA3433S	LED			

Fig. 10

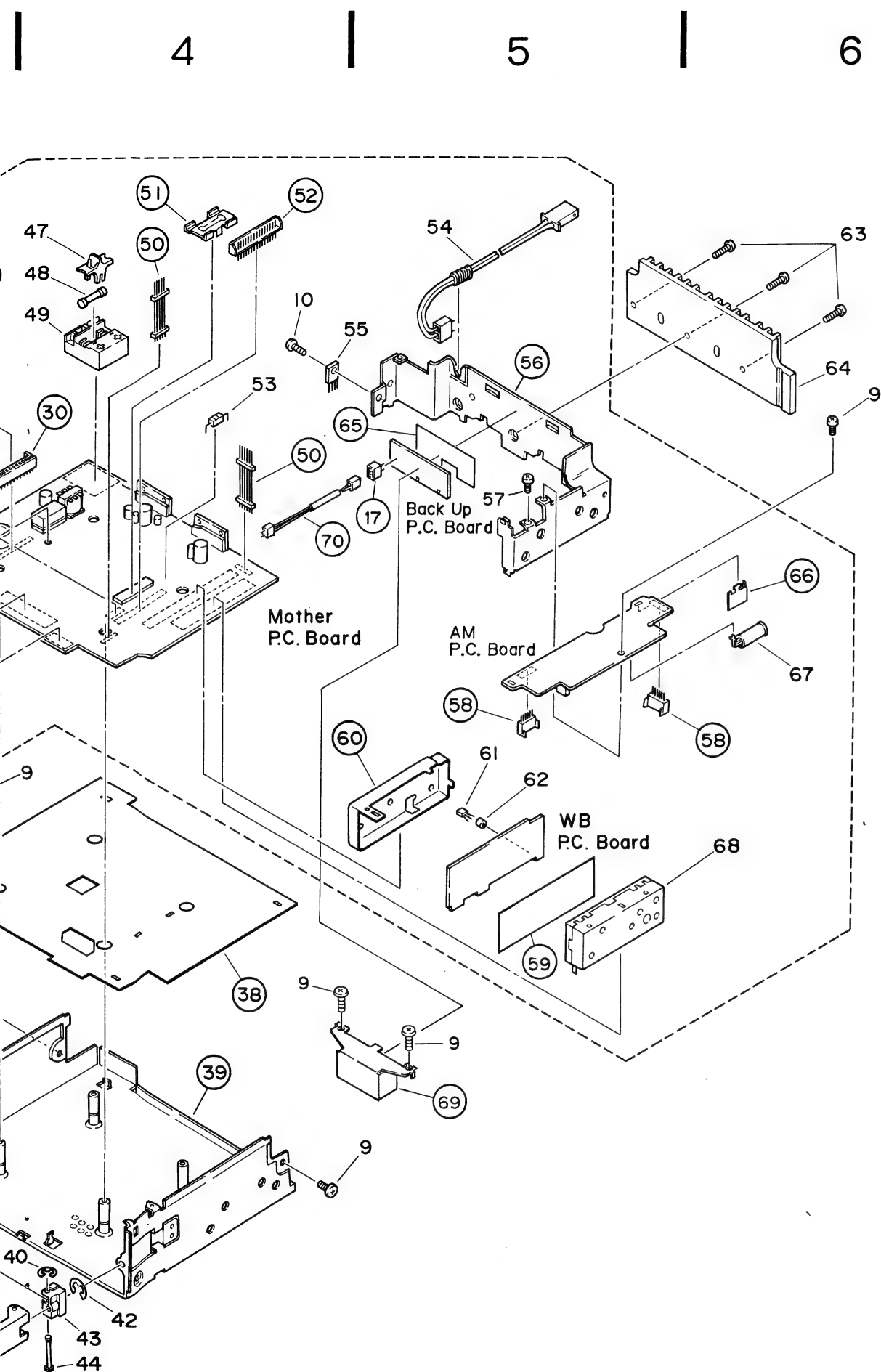


Fig. 11

● Parts List

Mark No.	Part No.	Description	Mark No.	Part No.	Description
1	CWM1144	LCD Unit	36	CKS1130	Connector
2	CWW1012	LCD	37		Plug
3	CNM1638	Spacer	38		Insulator
4		Insulator	39		Chassis Unit
5		Case	40	YE15FUC	E Type Washer
6	CWM1143	Tuner Amp Unit	41	CBH1019	Spring
7	CBA1015	Screw	42	YE20FUC	E Type Washer
8	CPV1004	Buzzer	43	CNR1016	Slider
9	BMZ26P050FMC	Screw	44	CLA1071	Shaft
10	BMZ26P080FMC	Screw	45	CNC1103	Clamper
11	2SD1276	Transistor	46	CLA1072	Bolt
12	CCS1055	Volume(VOLUME)	47	CNV1211	Fuse Holder
13		Frame	48	CEK1007	Fuse, 6.3A
14	CBN-003	Nut, M7	49	CKS1218	Connector
15		Holder	50		Plug
16	EBR3432S	LED	51		Heat Sink
17		Plug	52		Plug
18	CEL1003	Lamp, 14V 40mA	53	CEK1009	Fuse, 2A
19		Spacer	54	CDE1159	Connector
20	AA3433S	LED	55	AN6540	IC
21		Connector	56		Frame
22	CEL1019	Lamp, 8V 60mA	57	BMZ26P030FMC	Screw
23	CNV1207	Holder	58		Connector
24	CNV1144	Holder	59		Insulator
25	CNM1155	Sheet	60		Case
26	CNV1454	Connector	61	2SK241	Transistor
27	CCS1016	Volume (TREBLE, BASS)	62	CTX-022	Bead Core
28	PMS26P040FMC	Screw	63	BMZ30P080FMC	Screw
29		Plug	64	CNR1061	Heat Sink
30		Connector	65		Insulator
31		Plug	66		Shield
32		Connector	67	CKX1006	Antenna Connector
33		Clamper	68	CWB1004	FM Front End
34		P.C. Board	69		Case
35	NR9200A	IC	70		Connector

11. ELECTRICAL PARTS LIST

NOTE:

- For your parts Stock Control, the fast moving items are indicated with the marks ** and *.
 - ** : GENERALLY MOVES FASTER THAN *.
 - This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
 - Parts whose parts numbers are omitted are subject to being not supplied.
 - The part numbers shown below indicate chip components.
- Chip Resistor
RS1/8S □□□J, RS1/10S □□□J
- Chip Capacitor (except for CQS.....)
CKS....., CCS....., CSZS.....

Tuner Amp Unit(KE-81ZBM-02)

Consists of

- Mother P.C.Board
- AM P.C.Board
- WB P.C.Board
- Dolby NR P.C.Board
- Lamp P.C.Board
- Back Up P.C.Board
- FM Front End(CWB1004)

Unit Number : CWB1004

Unit Name : FM Front End

MISCELLANEOUS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
** IC	1			CWV1015 (CWV-173)	
** IC	2			PA4009	
** Q	1	3		2SK241	
** Q	2			2SC2753	
				(2SC2570)	
* D	1			KV1310A-3	
L	1		Coil	CTC1001	
L	2		Coil	CTC1002	
L	3		Coil	CTC1003	
L	4		Inductor	CTF-185	
T	1		Coil	CTC1005	
T	2		Coil	CTC1004	
CF	1	2	Ceramic Filter	CTF-182	
* KV1310A-3 Consists of 3 parts. Separate it into 3 parts before installation. (Be sure replace 3 parts at a time.)					

RESISTORS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
R	1	14		RS1/8S223J	
R	2			RS1/8S473J	
R	3			RD1/4PS222JL	
R	4			RD1/4PS221JL	
R	5	10		RS1/8S560J	

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
R	6	9		RS1/8S683J	
R	7			RS1/8S101J	
R	8			RS1/8S680J	
R	11			RS1/8S391J	
R	12			RS1/8S331J	
R	13			RD1/4PS680JL (RD1/6PS680J)	

CAPACITORS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
C	1			CCSSH330J50	
C	2			CCSSH390J50	
C	3			CCSCH060D50 (CCSCH060C50)	
C	4			CCSTH060C50	
				(CCSTH060D50)	
C	5	11 15 20		CKSYB222K50	
C	6			CCSCH040C50	
C	7	10		CKSYB103K50	
C	8			CCSCH100D50	
C	9			CCSSH560J50	
C	12	18		CCSTH150J50	
C	13			CCSTH330J50	
C	14			CCSTH100D50	
C	16	19 21		CKSYB223K50	
C	17			CCSUJ080D50	
C	22			CEA2R2M35LS	
C	23			CEA3R3M25LS	
C	24			CCSSH030C50	

Unit Number :

Unit Name : Tuner Amp Unit

MISCELLANEOUS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
** IC	51			PA0013	
** IC	101			KHA115	
** IC	151			LA3430P	
** IC	201			LA1135	
** IC	251			M51522AL	

Mark	===== Circuit Symbol & No.	==== Part Name	Part No.	Mark	===== Circuit Symbol & No.	==== Part Name	Part No.
**	IC 301		NR9200A	T	51	Coil	CTC-198
**	IC 501		μ PB553AC	T	201	Coil	CTB1011
**	IC 551 552		HA13001P	T	202	Coil	CTB1012
**	IC 601		PA3019	T	203 204	Coil	CTB1013
**	IC 701		PD4081D	T	205	Coil	CTB1014
**	IC 702		PDH001	T	206	Coil	CTE1011
**	IC 703		MB88307	T	207	Coil	CTE1012
**	IC 704		LB1213	RY	751	Relay	CSR-042
**	IC 705		M51957BL	CF	51	Ceramic Filter	CTF-182
**	IC 751		AN6540	CF	201	Filter	CTF-100
**	IC 801		TK10483Z	CF	202	Ceramic Resonator	CTF-247
**	Q 201		2SK435	CF	801	FM Ceramic Filter	CTF-101
**	Q 202 203 204 251 252 451 452 502 553 554		2SC2458	CF	802	Filter	CTF1004
	603 604 653 701 763 765 901 902 903		(2SC1740S)	1B	1 2	47kΩ×4	CWW-247
**	Q 301 302 551 552		2SD1012	X	151	Ceramic Resonator	CSS1028

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.	Mark	====	Circuit Symbol & No.	====	Part Name	Part No.						
R	261	262			RS1/8S332J	C	151			CEA100M25LS							
R	263	264			RS1/8S104J	C	152			CKSYB183K25							
R	301	302	309	310	RS1/8S473J	C	154			CKSYB103K50							
R	451	452	656	775	RD1/4PS222JL	C	155			CEA3R3M50L2							
R	501				RS1/8S474J	C	156			CEA010M50LS2							
R	502	503	553	554	555	556	607	756	763	765	RD1/4PS472JL	C	157			CSZAR22K35	
R	505	757			RD1/4PS152JL	C	158			CKSYF104Z25							
R	506	508	510	567	568	605	707	709	735	RD1/4PS103JL	C	159	160	259	260	CKSYB223K50	
R	509				RD1/4PS225JL	C	201	223		CKSYB103K50							
R	551	552	712	739	761	768	772	779	781	917	RD1/4PS223JL	C	202			CKSYB222K50	
R	557	558	559	560		RD1/4PS470JL	C	203	206		CEA470M16LS						
R	561	562	572	657	721	914	927			RD1/4PS102JL	C	204	215			CCSUJ220J50	
R	563	564	565	566		RD1/4PS1R5JL	C	205	211	216	217	218	220			CKSYF473Z50	
R	571	714	764		RD1/4PS153JL	C	207			RD1/4PS153JL	C	207				CCSCH010C50	
R	573	574	825		RS1/8S103J	C	208	209								CCSSH100D50	
R	601				RD1/2PS471JL	C	210	224	225		CKSYB223K50						
R	602	818			RD1/4PS182JL	C	212			CEA010M50LS2							
R	603				RS1/8S684J	C	213			CCSRH101J50							
R	606	710	738		RD1/4PS562JL	C	214			CQPA431G2A							
R	652	767	769	771	773	928	929			RD1/4PS472JL	C	219				CEA470M16L2	
R	654	705	706	751	923		RD1/4PS103JL	C	221		CEAR47M50L2						
R	708	711	715	716	717	724	726	727		RD1/4PS473JL	C	222				CEA3R3M50L2	
R	713	718	719	720	729	730	733	762	777	782	RD1/4PS473JL	C	226			CEA4R7M35L2	
R	723	725	728	731	732		RD1/4PS224JL	C	251	252	CKSYB391K50						
R	734	912	916	930		RD1/4PS471JL	C	253	254		CEANL4R7M35LL						
R	736	760	766	770	774	776	778	922		RD1/4PS103JL	C	256				CEA220M16LS	
R	737				RS1/8S105J	C	257	258			CQMA103J50LL						
R	755	758	926		RD1/4PS100JL	C	261			CEA101M10LL							
R	759				RD1/2PS821JL	C	301			CEA221M10L2							
R	801				RD1/4PS223JL	C	302			CEA101M10L2							
R	802				RD1/4PS562JL	C	451	765		CEA470M16LS							
R	803				RD1/4PS102JL	C	453	454		CEA4R7M16NPLL							
R	804	809	811		RD1/4PS331JL	C	501	553	554	CKCYB821K50							
R	805	810			RD1/4PS470JL	C	503	504	509	CKSYB103K50							
R	806				RS1/8S682J	C	505	506		CSYA100M160S							
R	807				RD1/4PS153JL	C	508	706	756	CKSYF473Z50							
R	808				RS1/8S181J	C	551	552		CEAR47M50L2							
R	812	822			RD1/4PS473JL	C	555	556	557	558	563	564	565	566	CEA101M10L2		
R	813	821			RD1/4PS104JL	C	559	560		CQMA223J50							
R	814				RD1/4PS391JL	C	567	568	569	570	CQMA104K50						
R	815				RS1/8S183J	C	571	572		CQMA102J50							
R	816	820	824		RD1/4PS332JL	C	573	574		CEA102M16L2							
R	817	819			RD1/4PS103JL	C	575			CEA220M16L2							
R	906	907	908	909	910	924	RD1/4PS391JL	C	577	578	CQEA473J50						
R	911	913	915	936		RD1/4PS561JL	C	607			CEAR68M50LS2						
R	918	920			RD1/4PS223JL	C	608	609		CEA470M6R3LS							
R	931				RD1/4PS2R2JL	C	610			CEA221M16L2							

CAPACITORS

Mark	=====	Circuit Symbol & No.	=====	Part Name	Part No.					
C	51	52	53	60	61	502	507	703		CKSYB223K50
C	54	612								CKSYF154Z25
C	55	611								CCSCH330J50
C	56	601	602	603	604	605	606	761	762	764
C	57	455	456	561	562					CKSYF473Z50
										CEA4R7M35L2
C	58									CCSCH101J50
C	59	758	759							CEA010M50L2
C	101	153	255	303	304					CEA220M16L2
C	102	161	162							CKSYB332K50
C	103	826								CKSYF473Z50
C	701	702								
C	704									
C	705									
C	712	763								
C	714	903								
C	751									
C	752	754								
C	753									
C	755									
C	757									

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
C	760	904			CEA470M16L2
C	801	814			CCSCH020C50
C	802	803			CCSCH150J50
C	804	810 811			CKSYB102K50
C	805				CCSCH030C50
C	806				CCSRH331J50
C	807				CCSCH010C50
C	808	809 816 817 821 828			CKSYB103K50
C	812	813			CCSUJ101J50
C	815				CCSCH180J50
C	818				CCSCH040C50
C	819				CCSCH101J50
C	820				CCSCH050C50
C	822	823			CKSYF104Z25
C	824				CEA010M50LS2
C	825	829			CQEA683J50
C	827				CKSYF224Z50

Unit Number :
Unit Name : LCD Unit

MISCELLANEOUS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
**	IC	451			KHA125
**	IC	901			LC7580
**	IL	902 903 904		Lamp 8V 60mA	CEL1019
**	VR	451 452		Volume 50kΩ(B) LCD	CCS1016 CWW1012

RESISTORS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
R	454				RS1/8S473J
R	455	456			RS1/8S392J
R	934				RS1/8S563J
R	935				RS1/8S471J

CAPACITORS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
C	452				CEA0R1M50LS
C	902				CCSSL681J50

Unit Number :
Unit Name : Key Board Unit

MISCELLANEOUS

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
*	D	920 921 922 923 924		LED	LN12GC56
*	D	925 926 927 928 929		LED	LN81RC5V
*	D	930 931		LED	AA3433S
**	S	4 5 6 7 8 9		Switch	CSG1004

Unit Number :
Unit Name : Switch P.C.Board

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
**	S	1		Switch(CST SET)	CSN-089
**	S	2 3		Switch(CST IN, 70μS)	CSN1003
MR	1 2			Magnetic Resistive Device	SDME106B

Unit Number :
Unit Name : P.C.Board

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
*	D	1 2 3			1S1555

Miscellaneous Parts List

Mark	====	Circuit Symbol & No.	====	Part Name	Part No.
*	D	934		LED	AA4524K
**	S	3		Switch	CSH1001
**	HD	1		Head Unit	CXA1459
**	M	1 2		Motor(Head, Gear)	CXM1030
**	M	3		Motor(Capstan)	CXM1007

12. PACKING METHOD

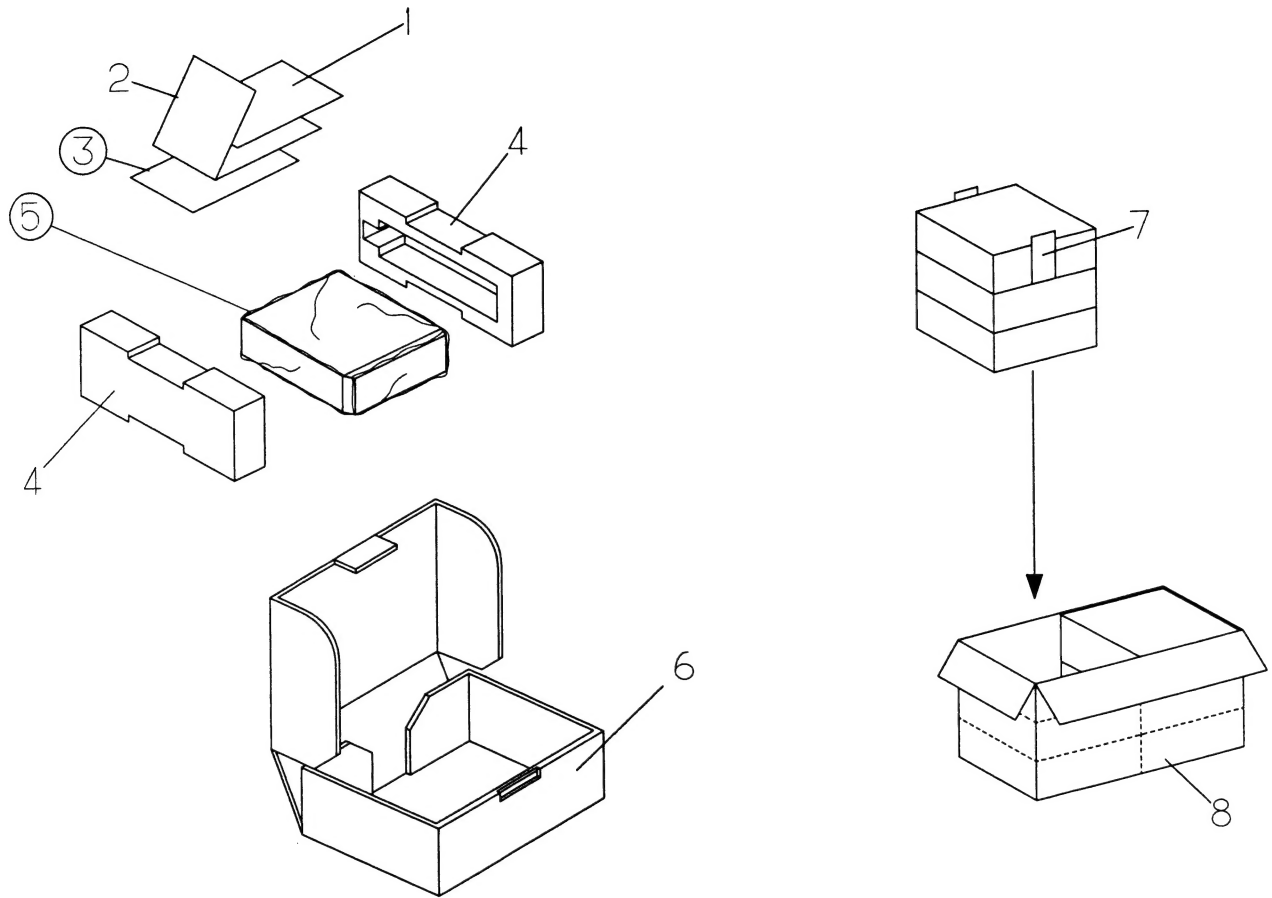


Fig. 12

● Parts List

Mark No.	Part No.	Description
1	CRB1032	Anti-Theft Radio Installation Instructions
2	CRB1031	Anti-Theft Program Instructions and Identification Card
3-1	CRY1005	Envelope
3-2		Label
3-3		Film
3-4	CRY1003	Card
3-5	CRW1014	Label
3-6	CRW1009	Tag
4	CHP1030	Styrofoam
5		Polyethylene Bag
6	CHG1336	Carton
7	CHW1009	Paper Sheet
8	CHL1336	Contain Box